

PC-WAND®

USER'S MANUAL

BARCODE ON LINE READER
model 300

PC-WAND[®]

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model 300 Rev 1.2

3503000010

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Chapter 1

INTRODUCTION

The PC-WAND model 300 series reader is a compact, rugged, smart barcode data terminal, especially designed to improve conventional data entry. It is configuration programmable through host downloading commands or by bar code label scanning, rendering this device easily adaptable to a variety of applications. The standard RS-232C and RS-485 communication interfaces allow the reader to be easily connected to most PC and host computers either by point to-point or through multidropped networking.

Our off-the shelf network port concentrator (model 950) and PC based communication software used in communication minimize the user's system implementation time and cost. Up to 128 readers can be accommodated in the network.

The reader can decode

- * Code 39
- * UPC/EAN
- * Interleaved 2 of 5
- * Codabar
- * Full ASCII Code 39
- * Code 11
- * Code 128

Scanners like pen type, auto-noncontacted and C.C.D., can all be connected in the 300 reader. Model 310 reader features an 16 x 2 LCD screen on the front panel. Both models can be operated in dumb terminal mode or enhanced protocol mode. The communication protocol is selectable by the setup command.

Chapter 2

INSTALLATION

2.1 BASIC CONFIGURATION

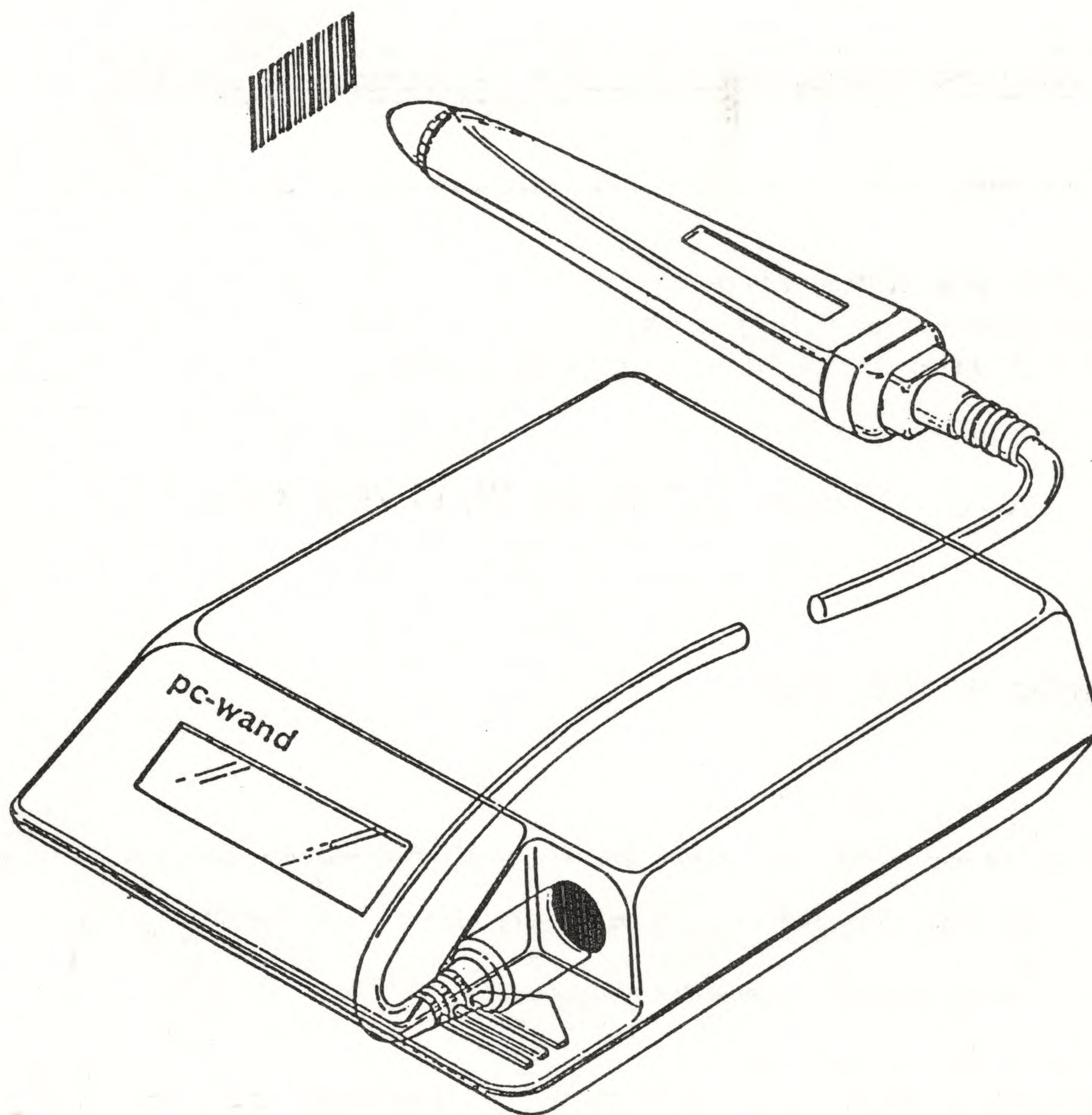
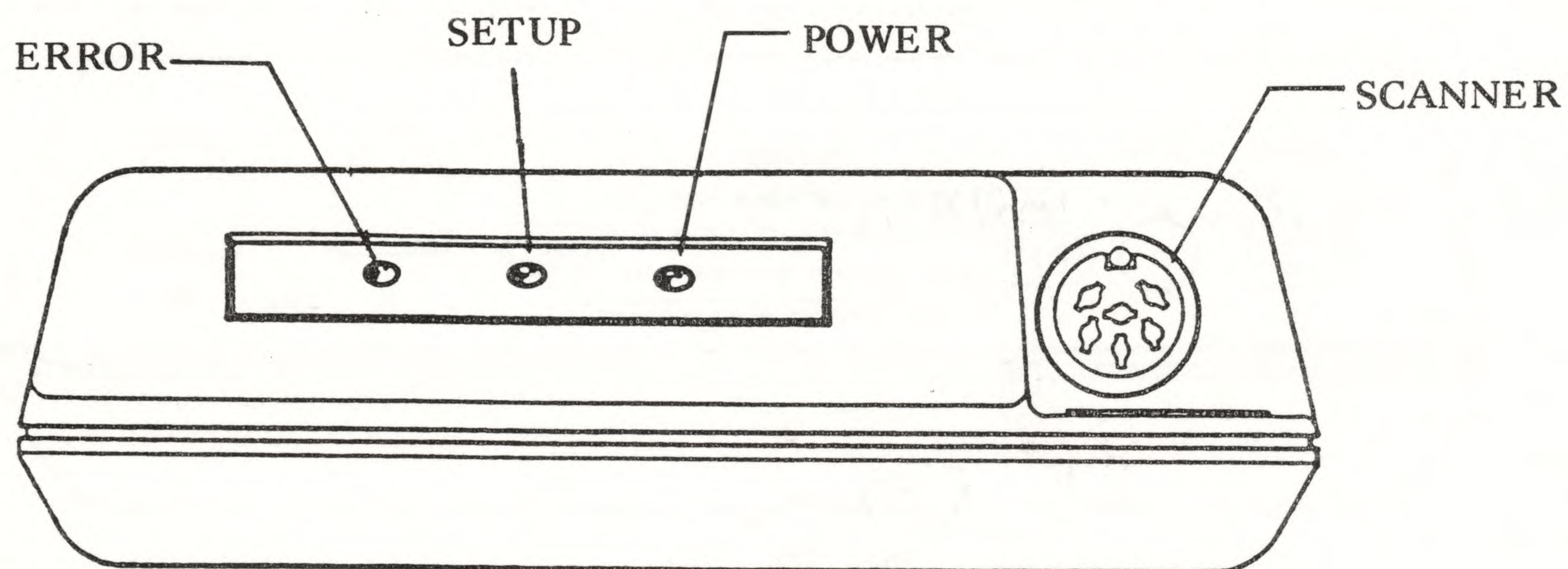


Figure 2.1 The outlook of 300 reader

front panel-model 300



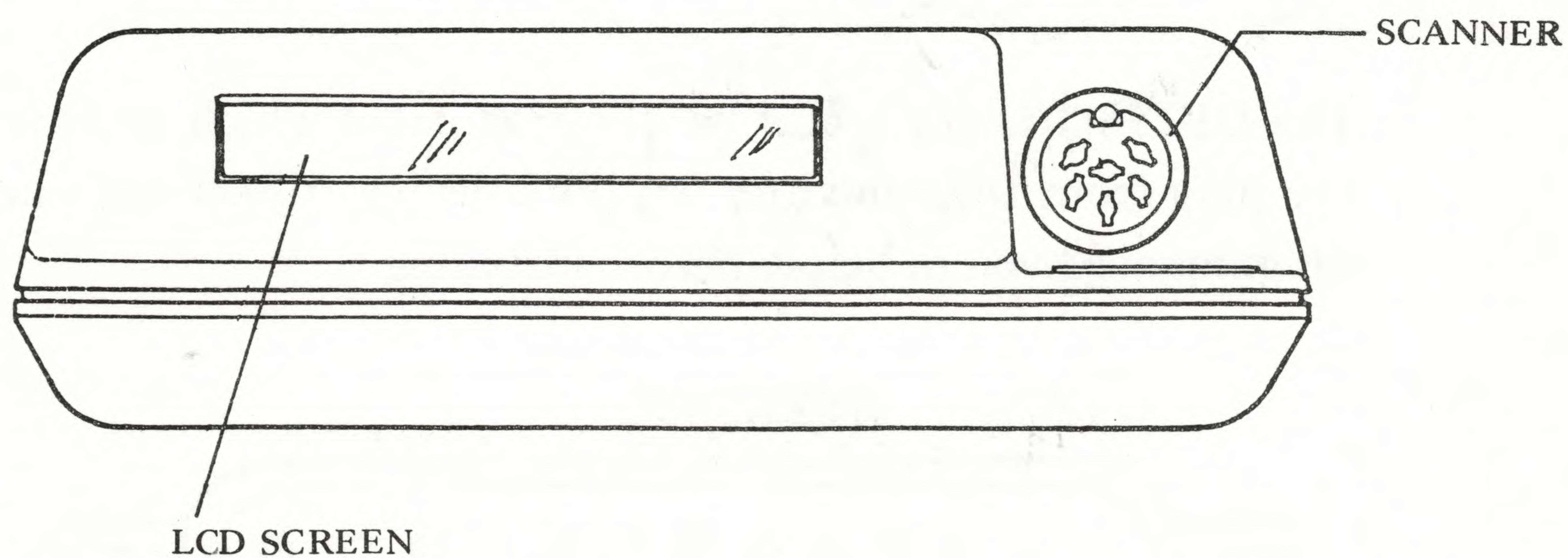
POWER LED: Reader power is on.

SETUP LED: Reader is in setup mode.

ERROR LED: An error condition exists in the system.

Figure 2.2 Model 300 front panel

front panel-model 310



LCD: display scan in data or setup status

Figure 2.3 Model 310 front panel

back panel

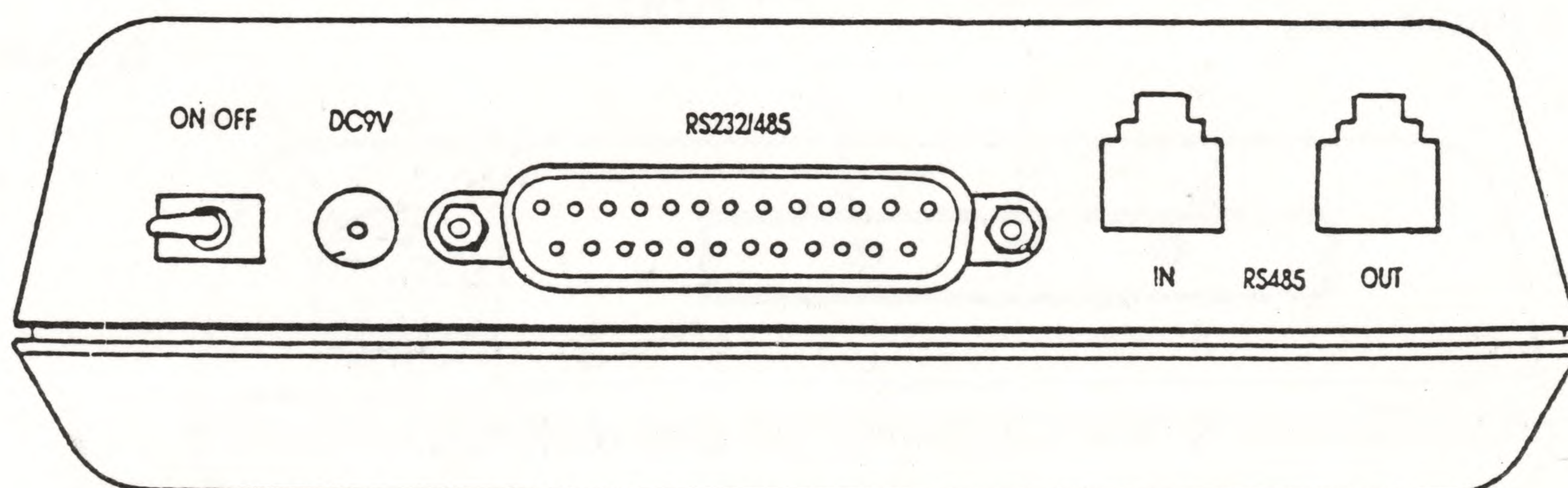
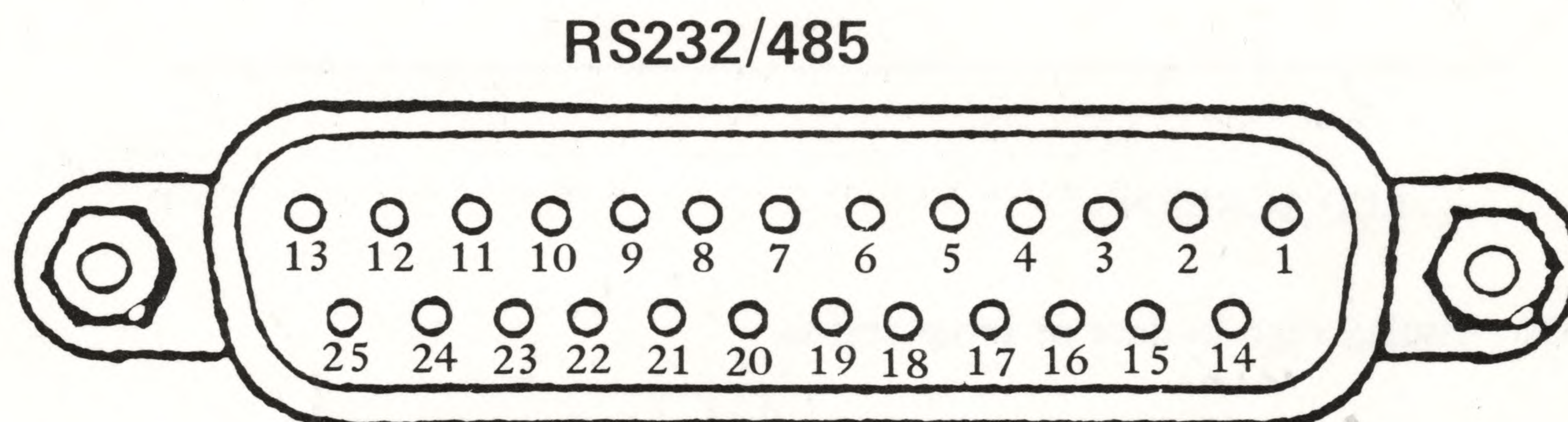


Figure 2.4 Model 300 series back panel

2.2 CABLE CONNECTION

2.2.1 CONNECTING TO A COMPUTER VIA RS-232C PORT <<POINT-TO-POINT>>

The DB25S I/O connector on the rear panel which accepts the plug from the computer is a DTE device. Check the pin assignments given in below before installing



DB25S

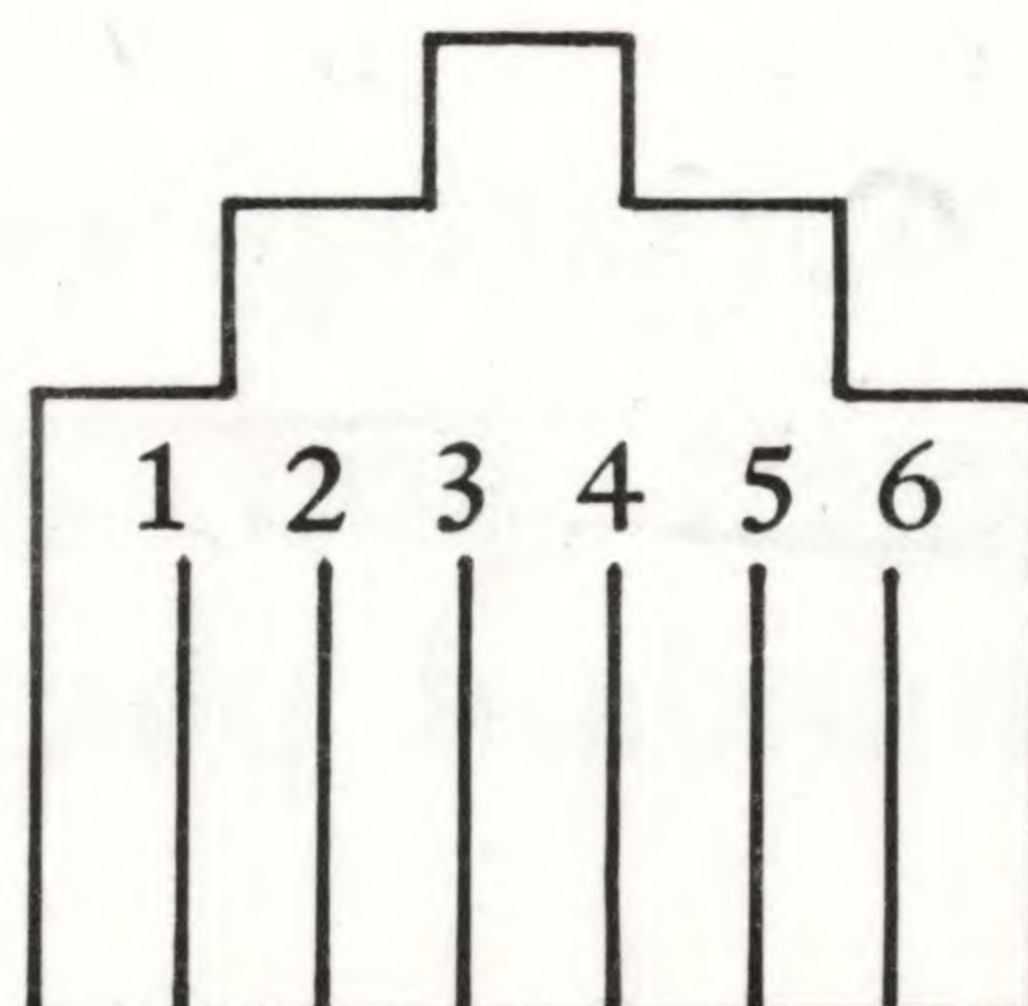
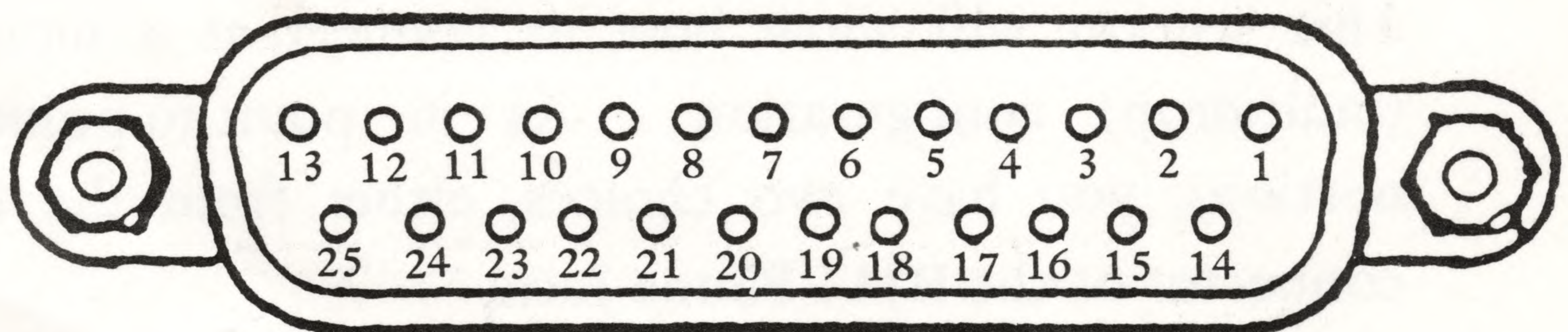
<u>Signal</u>	<u>Pin #</u>	<u>Description</u>
CG	1	Chasis Ground (optional)
TX	2	Serial data out, RS-232 transmitted data
RD	3	Serial data in, RS-232 received data
RTS	4	output, Request to Send
CTS	5	input, Clear to Send
GND	7	signal ground

2.2.2 CONNECTING TO A COMPUTER VIA RS-485/422 <<POINT-TO-POINT>>

The RS-485 signals come out from the DB25S connector or the RJ11 Phone Jack. The user has two choices for connecting RS-485 signals, either from the DB25S connector or the RJ11 Phone Jack.

Actually, the signals are tied together on a PCB.

RS232/485



DB25S

<u>Signal</u>	<u>Pin #</u>	<u>Description</u>
CG	1	Chasis Ground (optional)
TX (+)	22	RS-485 transmitted data +
TX (-)	23	RS-485 transmitted data -
RD (+)	24	RS-485 received data +
RD (-)	25	RS-485 received data -

RJ11 (IN or OUT)

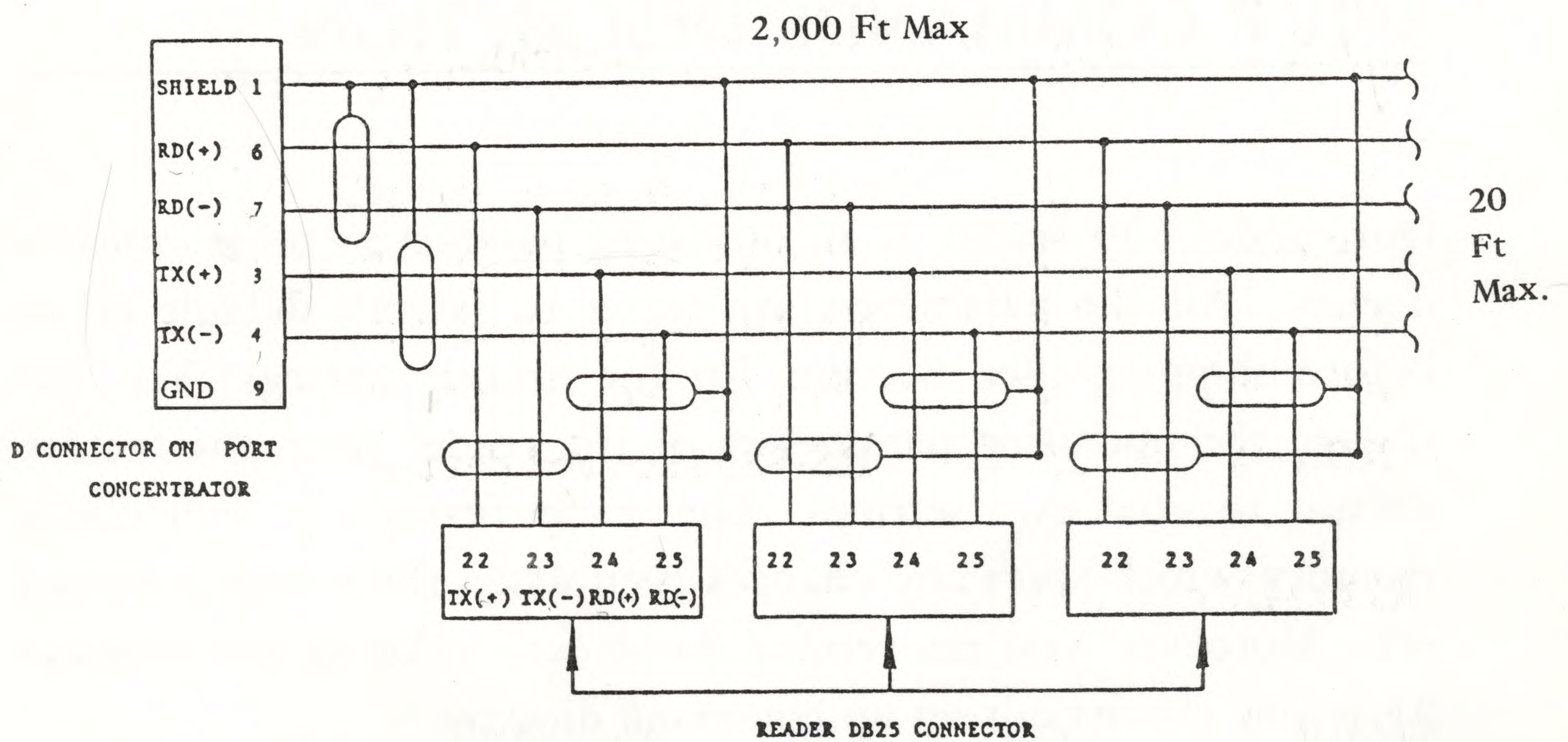
<u>Signal</u>	<u>Pin #</u>	<u>Description</u>
CG	1	Chasis Ground (optional)
TX (+)	2	RS-485 transmitted data +
TX (-)	3	RS-485 transmitted data -
RD (+)	4	RS-485 received data +
RD (-)	5	RS-485 received data -

2.2.3 CONNECTING TO A PORT CONCENTRATOR <<MULTIPOINT>>

This section will show how to connect as a multipoint (multidrop) configuration. As in point-to-point connections, you have two choices, either from the DB25S connector or the RJ11 Phone Jack.

When in critical operating environment or using longer distances, we suggest you use the DB25S connection; otherwise, use a standard phone line cable which is much easier to install.

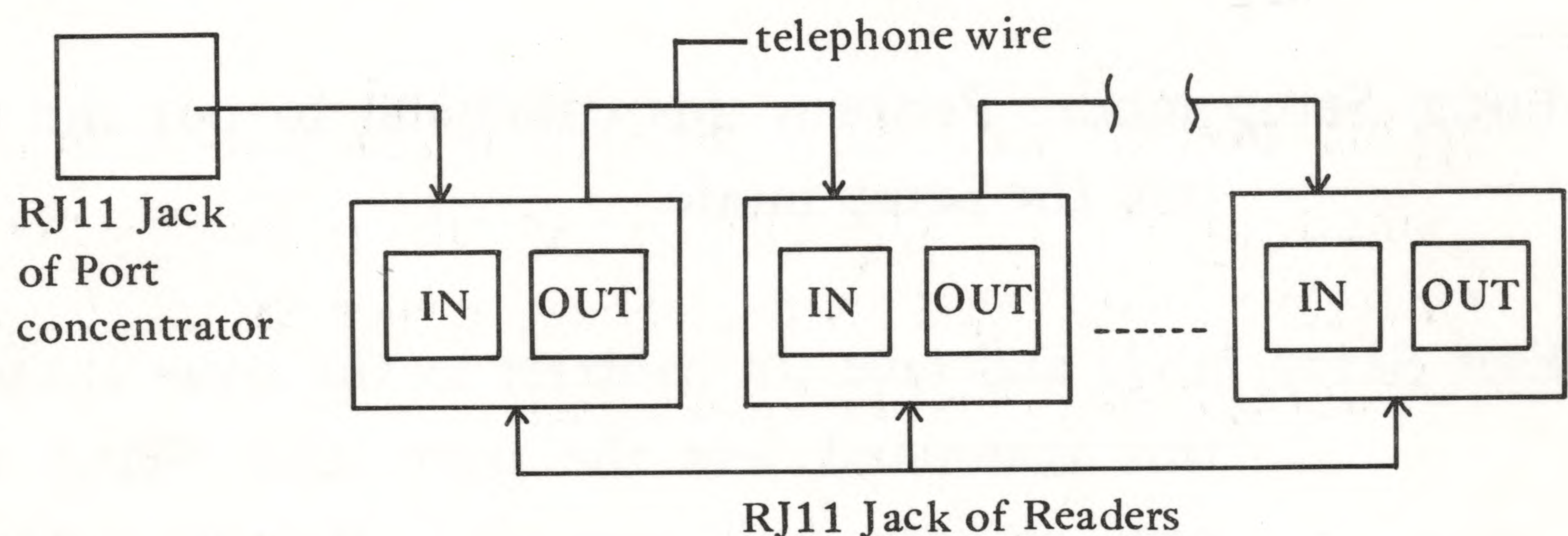
DB25S CONNECTION



Use a pair of twisted cable with shields, 24 or larger gauge, impedance of less than 150.

Refer to RS-485 standard specification if necessary.

RJ11 Phone Jack



Chapter 3

SETUP COMMANDS DESCRIPTION

Our model 300 reader is an operating parameters programmable device. All the parameters are preset to factory default values before shipping (See Section 3.6 for default settings) You can change the operating parameters of the reader from the factory default to your own settings. The reader features an nonvolatile memory which saves any changes even when the power is turned off. Moreover, you can restore the default value at any moment by issuing the default set up command directly.

The set up command can be input either from a host command or by bar code scanning.

This chapter will give you a general description of the set up commands. The commands can be categorized into 5 groups: control, barcode, data entry, communication and protocol.

3.1 CONTROL COMMANDS

- * Enter Setup mode: Perform this command to put the reader into the Setup mode.
- * Exit Setup mode and save: In contrast to the enter command, this command lets the user leave Setup mode; new settings will only be effective when this command is executed.

- * Abort command: Abort all the current settings, the previously set parameters in memory are not affected.
- * Default configuration: Restores all the changed parameters to their factory default value.
- * Hard reset: The system will be reset to system default when the pin-4 and pin-5 of DB-25 connector at the rear are looped during power-on.

3.2 BARCODE TYPES COMMANDS

- * Select barcode symbologies: The reader can autodiscriminately read several types of bar codes. This command group lets you to enable the type(s) of bar code symbols that you will scan. Though you can enable all the symbologies during scanning, however, for optimal reading speed and accuracy, you should disable any code that won't be used.
- * Select scanner type: The reader can connect with various types of scanners. Because different scanners have different level of logic signals, you should tell the reader what kind of scanner is currently installed.

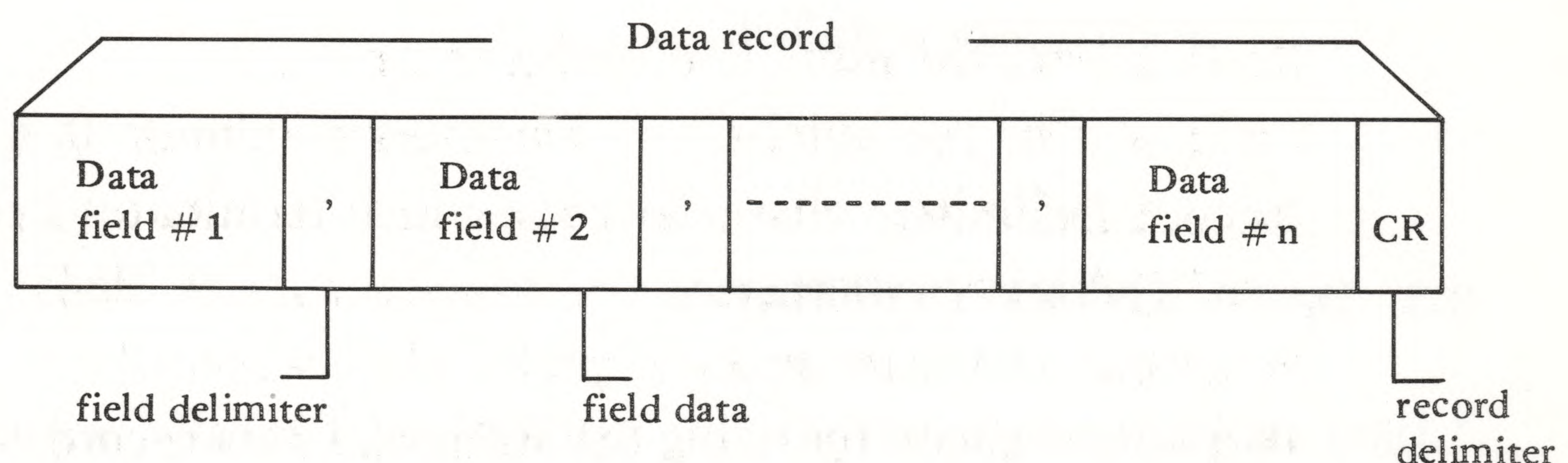
3.3 DATA ENTRY COMMANDS

- * Data attributes: In data collecting applications, basically, we enter the data according to a FORM, a form may consists of one or several FIELDS. The user scan a field label each time. To complete one form, he should scan one or more times. From the data point of view, we call a string of data a FIELD, and one complete form of data a RECORD. For regular label scanning, one record means one

field, for multiple label scanning, several fields are combined to form one record.

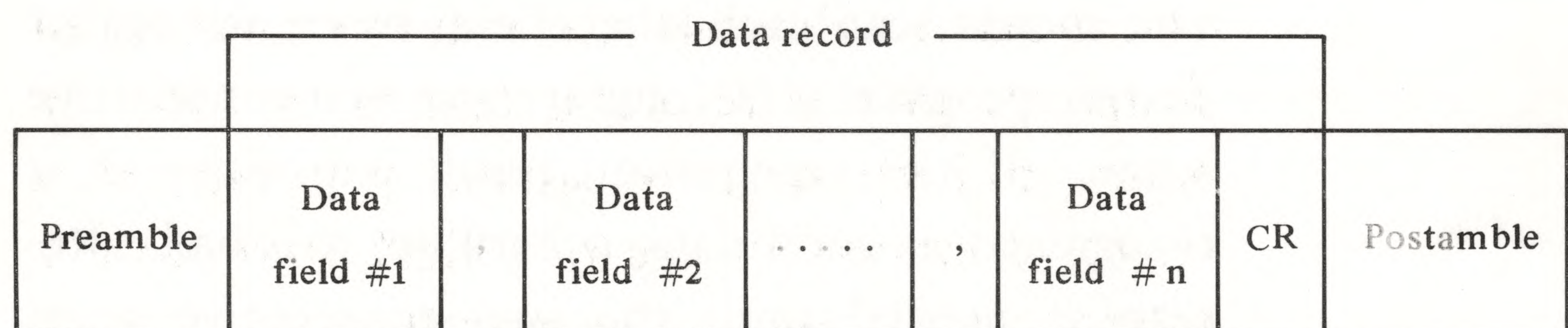
In the model 300 reader, scanned data is always transmitted to computer record by record. For regular label scanning, data will be transmitted immediately when scanning label finished. For multiple labels scanning, previously scanned field data will be temporarily stored in memory and will not be transmitted until the last field has been scanned. For the model 300 reader, a record may contain up to 16 fields, a field may contain up to 64 characters. However, the maximum number of characters in one record is limited to 256. In order to keep data consistent, you can select several delimiters to separate fields into records, and to separate consecutive records.

The following shows the data format of the reader when transmitting:



Nevertheless, for some host computers, it might be necessary to tag some character string on the data record for easy transaction process. It means that the data format would be: < preamble > < data record > < postamble >.

The preamble and postamble are used to fulfill this requirement. The preamble is a character string sent before data record. The user can define preamble and postamble separately, but with a limitation of total 40 characters maximum. Thus, if the preamble or postamble is selected, then the data format of reader when transmitting is as following:



The user can define the attributes as:

Record Size: the number of fields in a record

Field Width: the number of characters maximum in a field.

Record Delimiter: character code which terminates a record

Field Delimiter: character code which separates fields

Preamble: character string as prefix of data record

Postamble: character string following the data record

- * Start/stop characters eliminating: some barcode symbologies contain a start or stop character, for instance, leading zero or check digit, at most time, it's not necessary to transmit those characters to the

computer; this function enable the user to select to transmit the start, stop digit or not.

- * Check digit verification: some barcode symbologies contain check digit, i.e. Code 39 or EAN/UPC. When check digit verification is used, then the reader will verify the check digit according to the standard algorithm, otherwise, it just passes over.
- * Re-enter verification: In order to ensure the accuracy of the scanned data, the reader provides a re-enter verification scheme. When re-enter is enabled, you should scan each label (field) twice, the reader decode program will compare the two consecutive scans. If the comparison result is positive, it is recognized as good data, otherwise, it is bad. Re-scan is needed until the two consecutive scans are found to be equal.
- * Beeper volume: The reader beeps audibly in several cases to indicate the status of the reader. For instance, after a successful scanning, it beeps once. You can set the beeper to sound in high or low volume.

3.4 COMMUNICATION COMMANDS

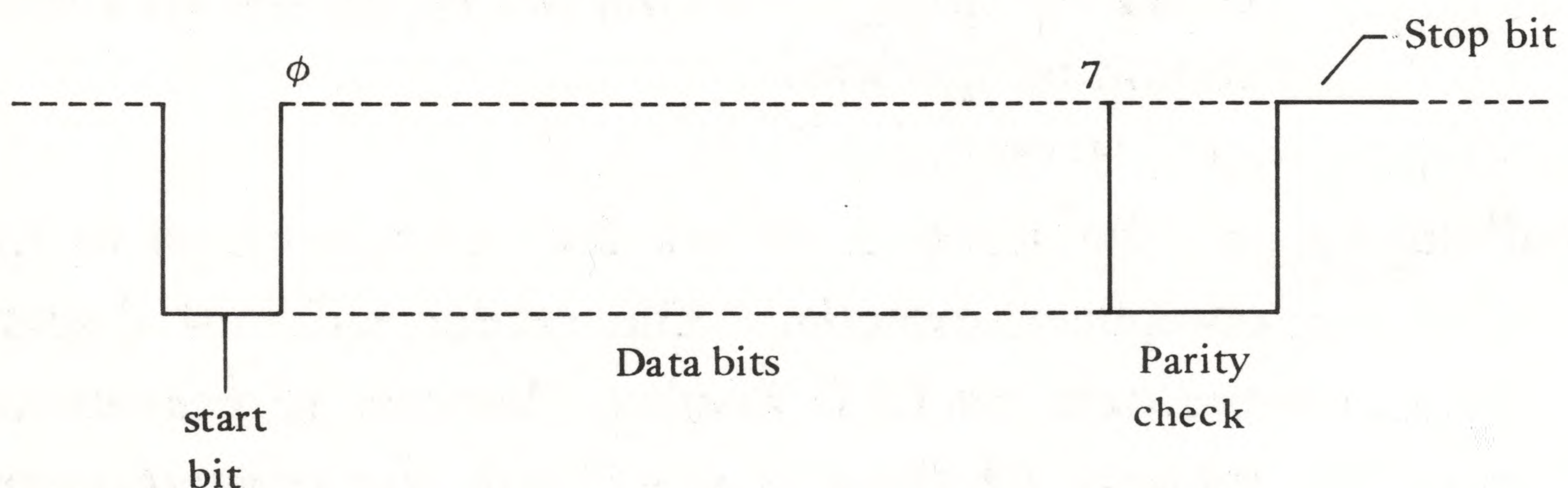
The reader is to be installed with a computer or a concentrator. The communication parameters of the serial port (RS-232C or RS-485) should be set to match the existing link protocols.

- * Handshaking: The reader transmit data back and forth, if the receiver that is processing the data is slower than the transmitter. In order to avoid data loss, handshaking is needed.

XON/XOFF: (CTRL-S, CTRL-Q), while receiving the XOFF code (13 HEX), the reader will temporarily stop sending data until the XON code (11 HEX) is received to resume sending.

CTS/RTS: These two signals are hardware signals emitted from the DB25 pin connector. When the reader is enabled, it will first activate the RTS (Request to send) signal which requests the host to send the data. Then it checks to see if the CTS (Clear to Send) input signal from the host is active. The reader will not send the data until the CTS is active.

- * Baud rate: a rate from 300 to 19.2 k baud can be selected.
- * Data bits: 7 or 8 bits
- * Parity check: The data format of both serial ports is



You can set the parity bit to one of five types
 “even, odd, space, mark or none”

Note, Since the 300 reader uses 10 bits or 11 bits of frame. You can not select 7 data bits with "none" Parity combination. Should you do so, it will be treated as 8 data bits with none parity.

- * Intercharacter delay: The delay is the time period that the reader will wait before sending each character. When sending to a slow processing host or full duplex data set, this delay is useful in keeping pace.
- * Time out delay: The time out delay is the amount of time that the reader will wait between receiving each character and announcing an error and also the amount of time the reader will wait for an acknowledgement. <See Protocol 3.5.1.>
- * On line mode: Note this command is only meaningful to mode 310 (with LCD screen)

Half-duplex: The reader send scanned record data to the computer and the LCD screen simultaneously. On the computer site, a half-duplex mode without echo should be specified.

Full-duplex: All the scanned record data is transmitted to the computer directly. The reader will not display the data on LCD display. Instead, it receives the message (if there is any) from the computer and then displays it on the screen.

- * **Communication mode:** Set the reader to communication with computer or concentrator through a user defined point-to-point, or a user defined multipoint. (See Section 3.5 for details.) Special X mode, is selected only when reader connects with model 950 port concentrator.
- * **Multipoint address:** When the reader is connected in a multipoint environment, a unique device address code should be assigned to each reader. Up to 32 readers can be connected with each channel of concentrator, the address should begin with number from 0 to 31.

3.5 **PROTOCOL:**

Model 300 has two communication ports, one an RS-232C, the other an RS-485. You should choose only one port at a time to operate properly.

However, no matter which port you are currently using, you can set the communication mode to either point-to-point mode or multipoint mode. Generally, the point-to-point mode is used when connecting the reader directly with a computer and the multipoint mode is used when connecting the reader with a general purpose data concentrator.

Both modes have their own protocols. The following figure illustrates the protocol data flow. For X mode details, please refer to PC-WAND model 950 user's menu.

Familiarize yourself with the following code terminologies first.

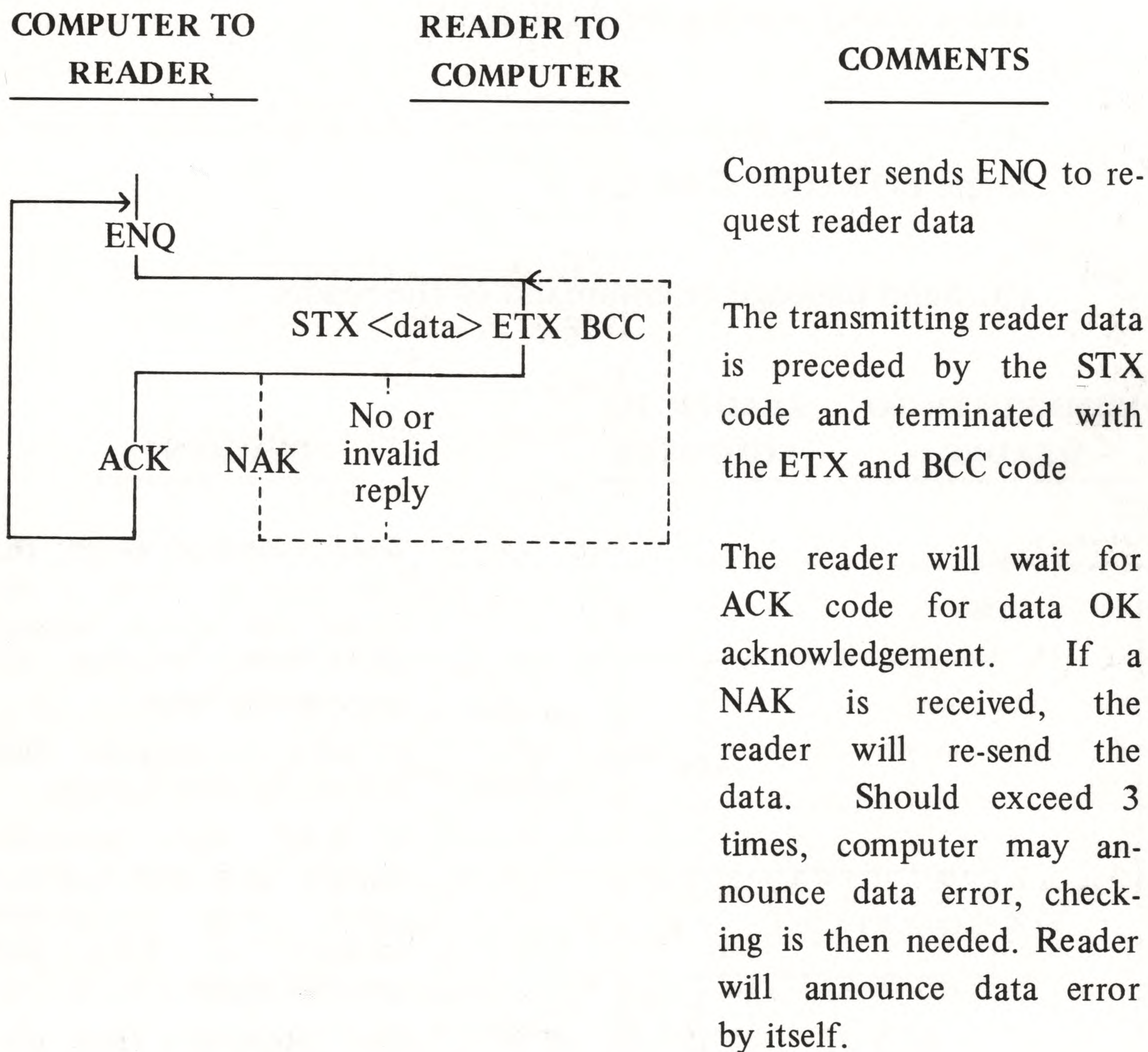
<u>Code</u>	<u>Hex</u>	<u>Description</u>
ENQ	05	Poll to request reader data
EM	19	Select to enter message
STX	02	Start of text
ETX	03	End of text
ACK	06	Affirmative acknowledgement
NAK	15	Negative acknowledgement
SOH	01	Start of header
UAC	—	One byte's unit address code
BCC	—	One byte's block check character
<data>	—	the reader data, max 256 bytes per transmitting
<text>	—	the message or command to be sent from the computer to the reader; max 256 bytes per transmitting

Note: (1) The following flow diagram shows the 'complete' protocols. Actually, since they are user definable, you can define your own protocol by enables/disables ENQ/EM, STX/ETX, ACK/NAK, & BCC etc through the setup commands.

(2) The BCC character is calculated as the "sum" of the data bits representing each of the characters in the data string. The BCC character when enabled, is the last character but is not part of the data string.

3.5.1 POINT-TO-POINT

(a). Request for reader data

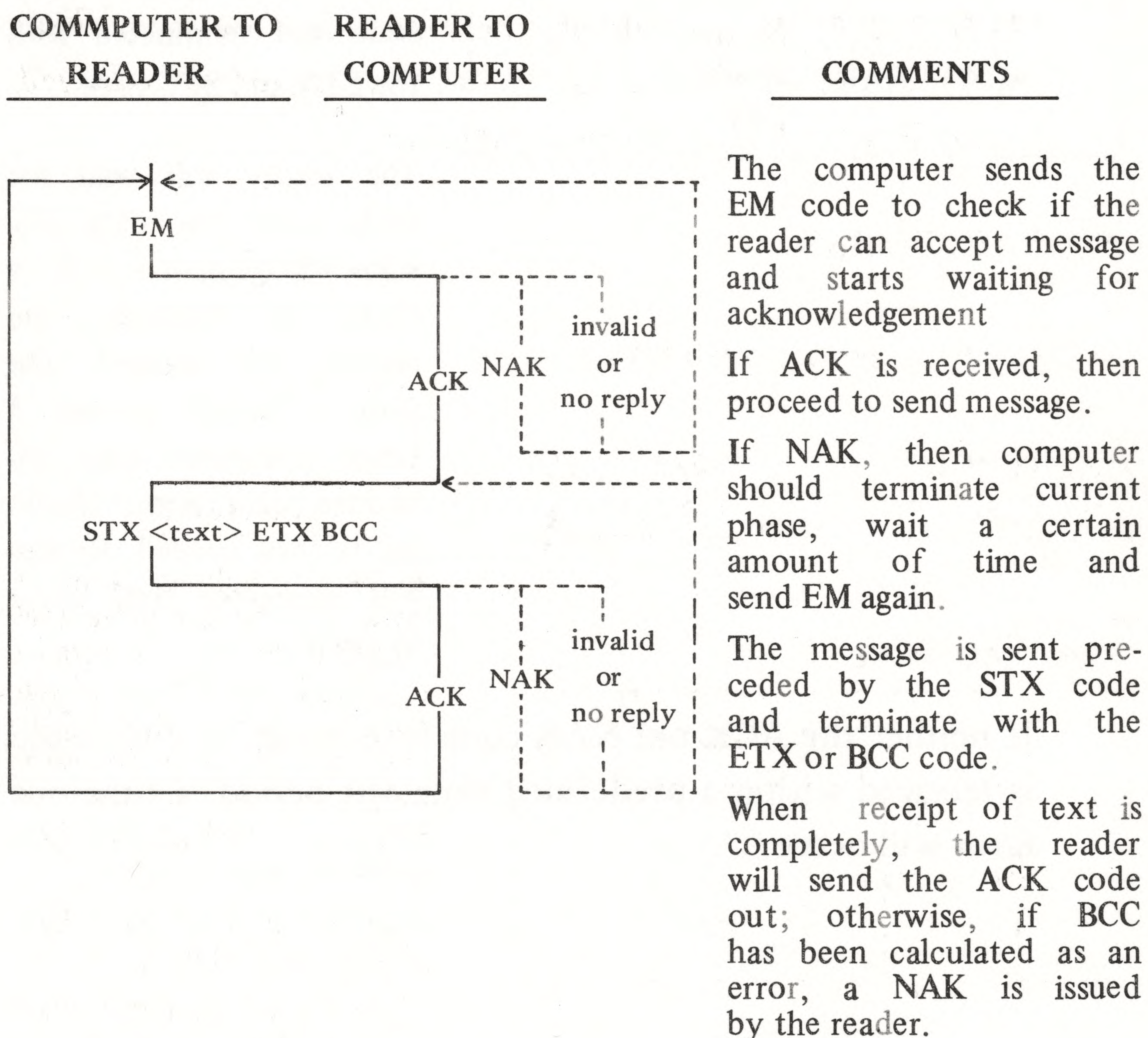


If neither the ACK nor NAK code is received, or if no reply is received within a predefined time out period, a time out error will occur.

If all the ENQ, STX/ETX, ACK/NAK & BCC are disabled, the reader is much like a dumb terminal, when it is finished scan a barcode label, reader will send it out without waiting for ENQ, without prefixing STX/ETX & BCC with data, and without waiting for ACK/NAK.

If there is no data in the reader, the reader will reply a single EOT code < 04 hex >.

(b). Send message or command to the reader



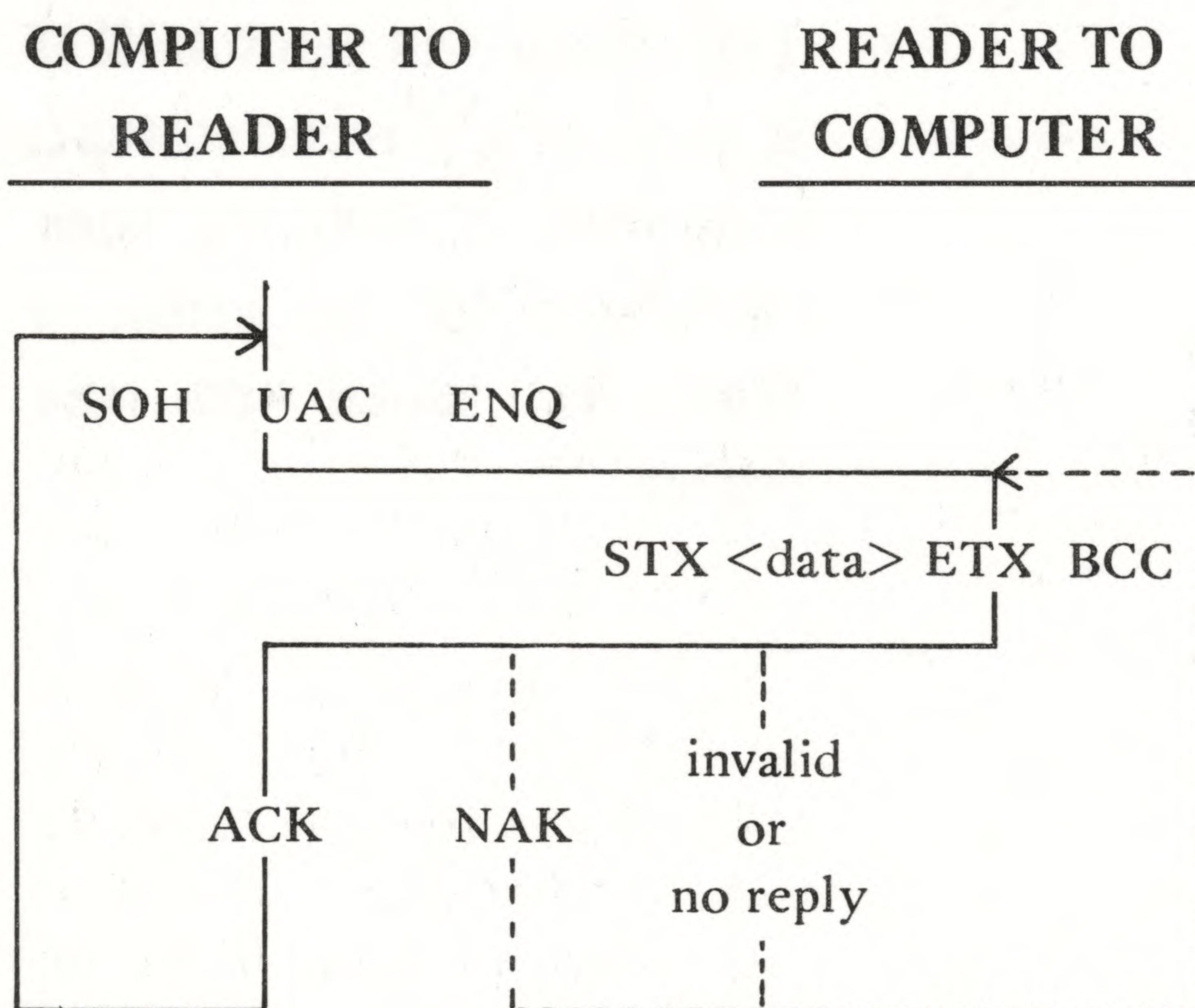
Again, as in (a), when EM, ACK/NAK, STX/ETX & BCC are all disabled, the computer sends text to the reader without request first, it means, the reader will always be ready for accepting messages from the computer.

Note: (1). One thing you should be aware of also, if ACK/NAK is enabled, but EM is disabled, there will be no ACK sent to the computer from reader in the beginning phase, that is, computer will send STX <text> ETX directly, then wait for ACK.

(2). If STX/ETX is disabled, the text sent from computer should be line based, i.e. end of text should be followed by Record Delimiter or Postamble.

3.5.2 MULTIPOINT

(a). Request for reader data



3 bytes' polling code is issued to request individual reader' if there is any data to send, only the readers which comply with the UAC address will respond with data string.

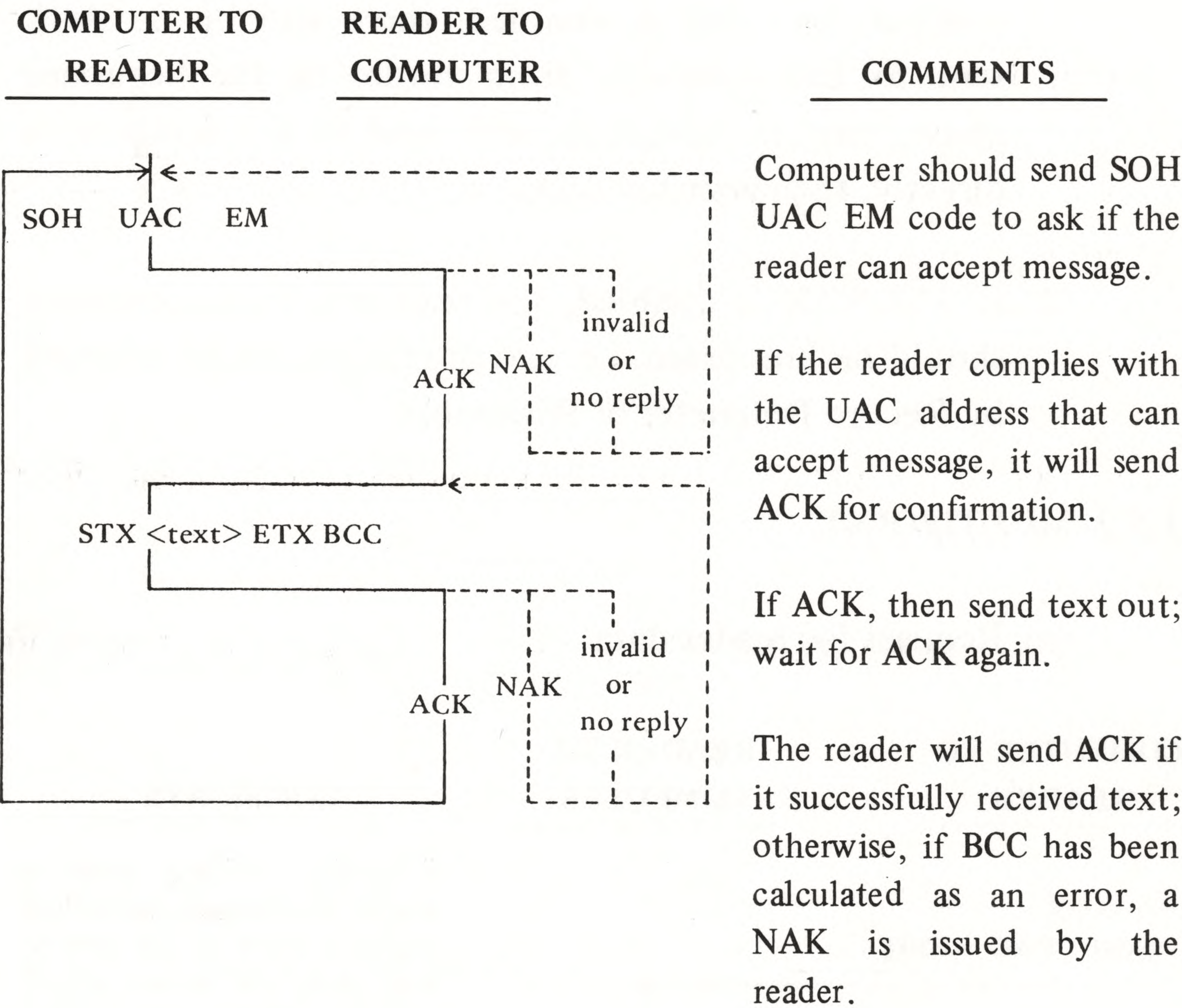
<data> = <04(hex)> when reader empty.

Reader will wait for ACK, if NAK, resend data.

If invalid or no reply, wait for expiration of time out period before announcing time out error.

In multipoint mode, you can also selectable STX/ETX, ACK/NAK & BCC as optional protocols, but SOH UAC ENQ is always mandatory.

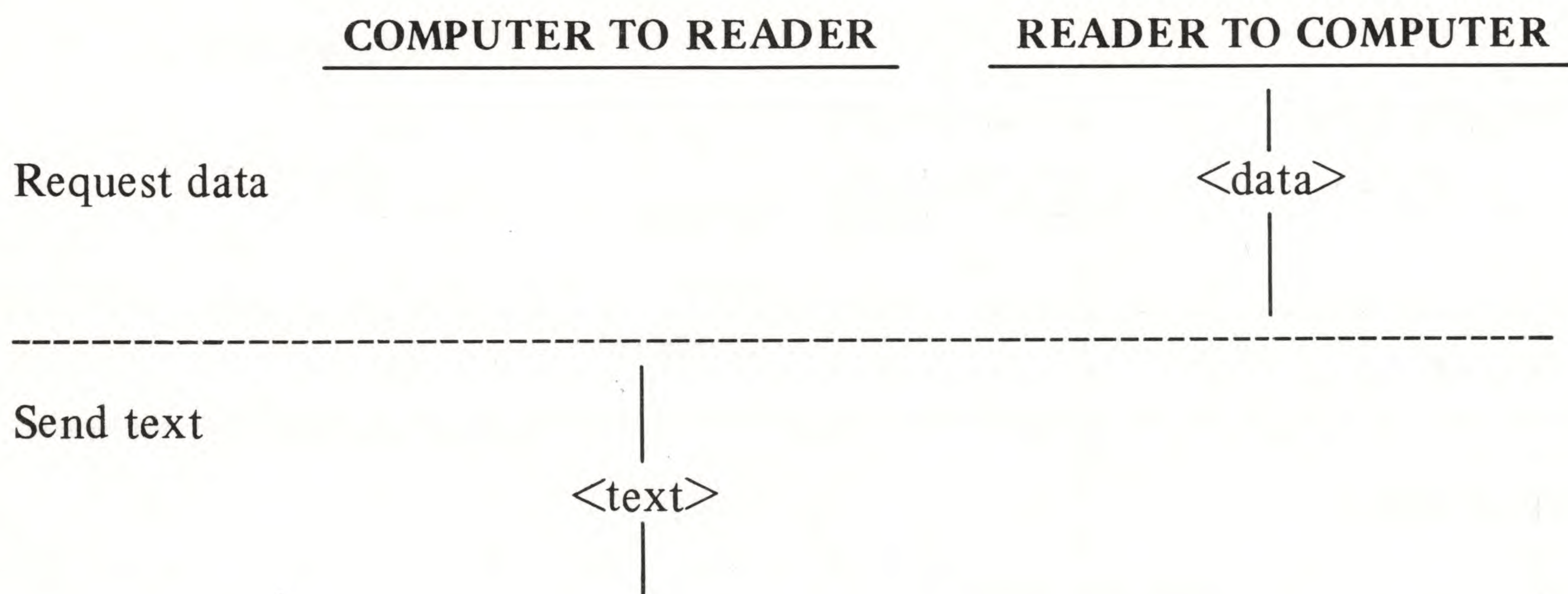
(b). Send message or command to the reader



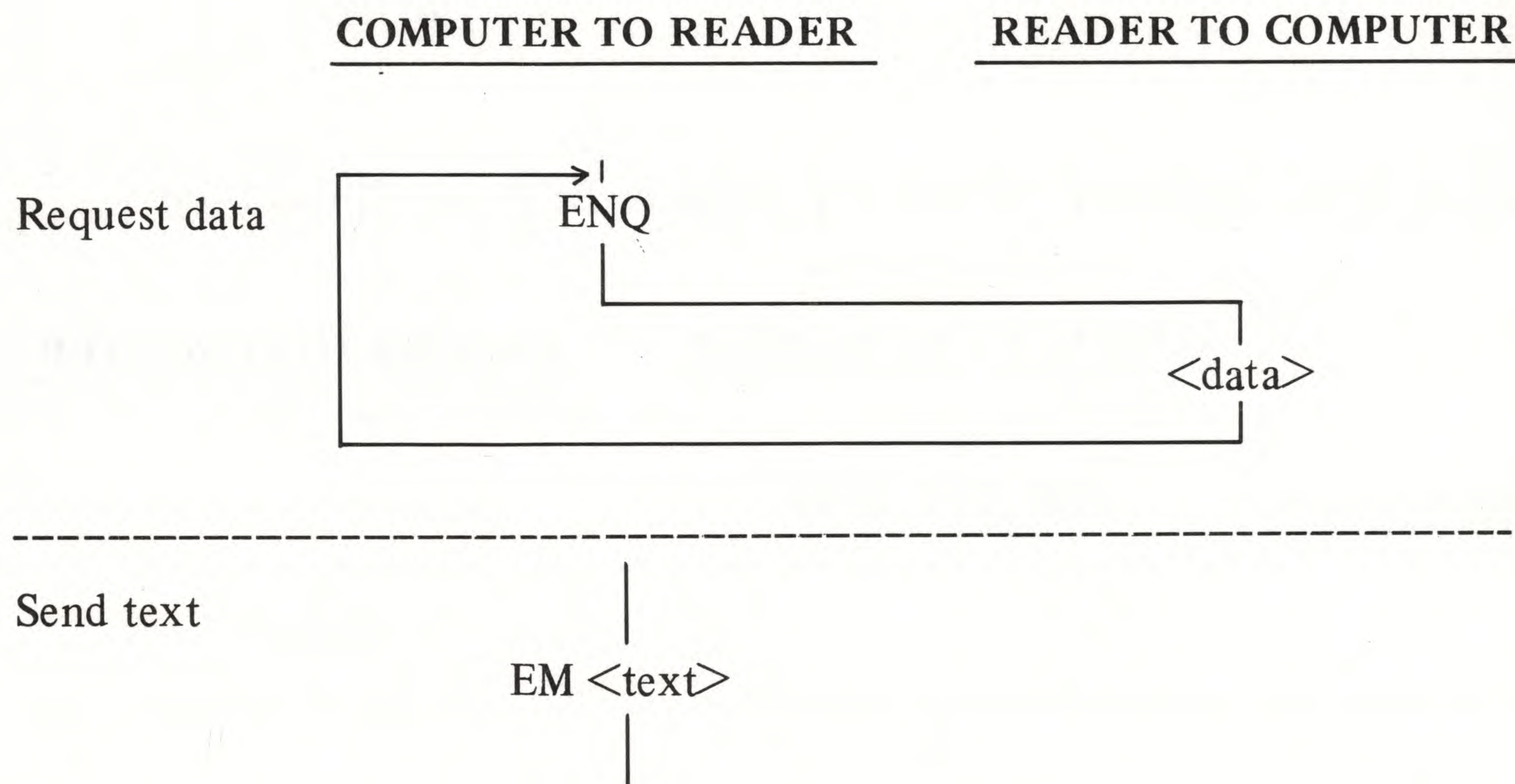
Note: If STX/ETX is disabled, the text sent from the computer should be followed by a CR, LF or CRLF terminator.

Example of protocol options:

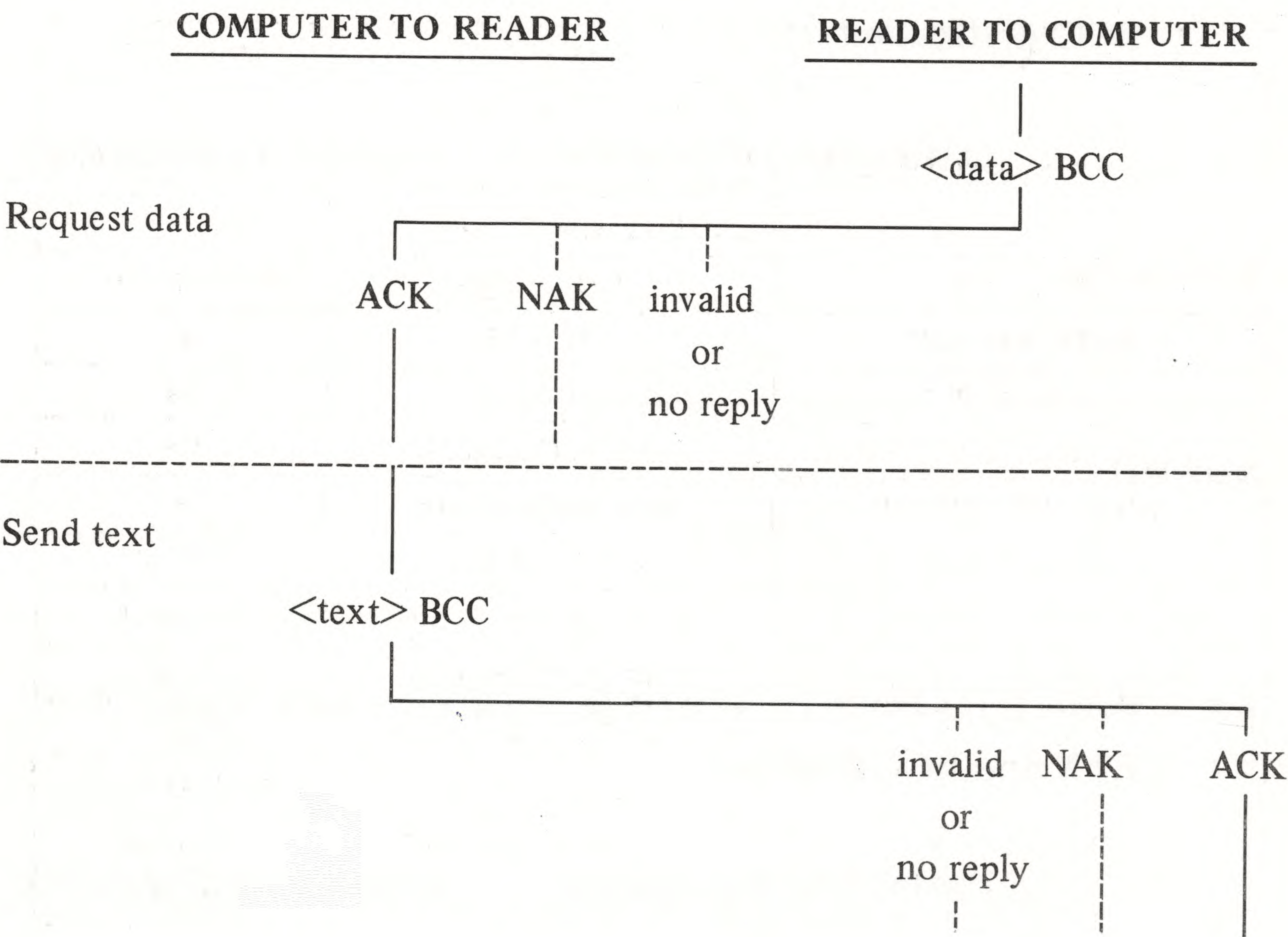
EX 1. POINT-TO-POINT. ENQ/EM, STX/ETX, ACK/NAK and BCC all disabled



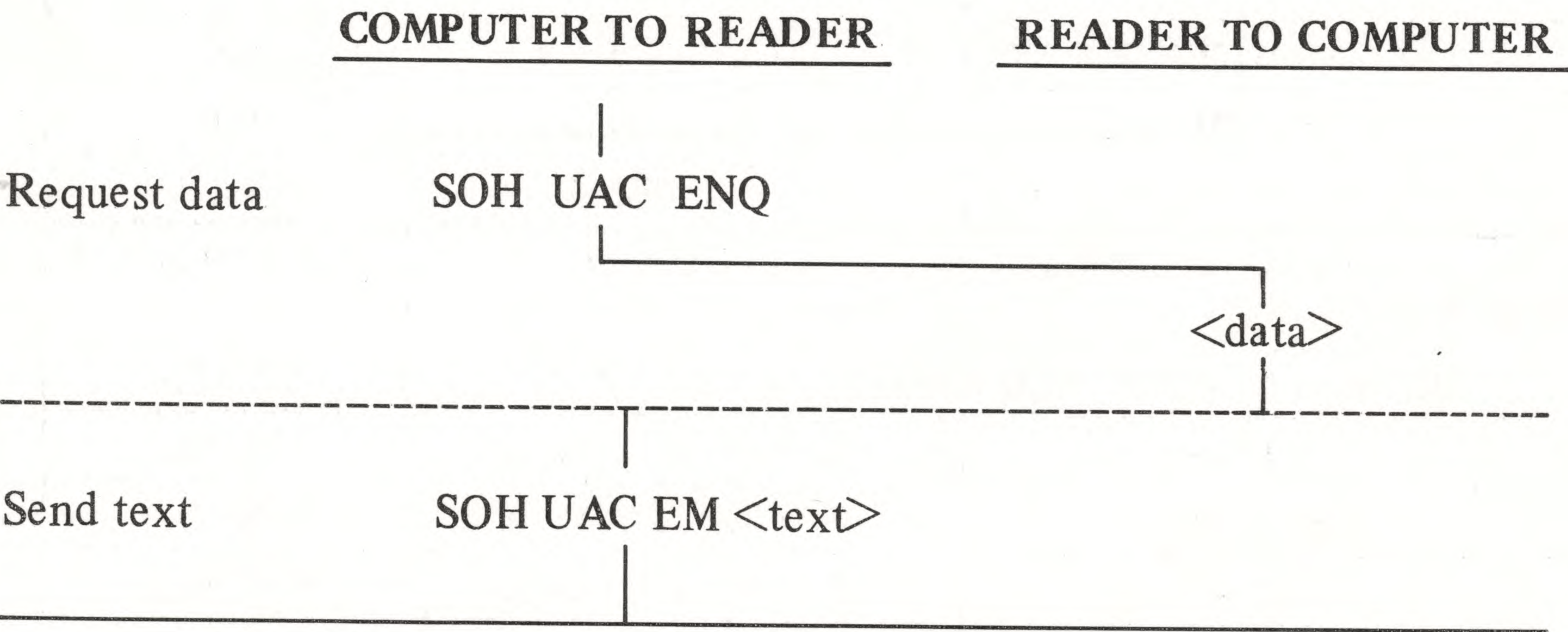
EX 2. POINT-TO-POINT, ENQ/EM enabled, ACK/NAK, STX/ETX and BCC disabled



EX 3. POINT-TO-POINT, ENQ/EM disabled, STX/ET disabled,,
 ACK/NAK and BCC enabled.



EX 4. MULTIPOINT, STX/ETX, ACK & BCC are all disabled



3.6 DEFAULT VALUES

PARAMETERS DEFAULT TABLE

ITEMS	CONTENTS	DEFAULT
BARCODE SYMBOLOGIES	UPC/EAN: CODE 39 I 2 OF 5; CODABAR FULL ASCII CODE 39; CODE 11; CODE 128	ALL ENABLED
SCANNER	PEN/AUTO	PEN TYPE
BARCODE SIZE	01 – 16	01
FIELD WIDTH	1 – 64	64
RECORD DELIMITER	ANY ASCII CODE	CR
FIELD DELIMITER	ANY ASCII CODE	,
PRE/POST AMBLE	ASCII STRING	NONE
START/STOP MARKING	ENABLE/DISABLE	DISABLE
CHECK DIGIT VERIFY	ENABLE/DISABLE	DISABLE
RE-ENTER	ENABLE/DISABLE	DISABLE
BEEPER VOLUME	LOW-0, HIGH-9	MEDIUM (5)
XON/XOFF	ENABLE/DISABLE	ENABLE
CTS/RTS	ENABLE/DISABLE	DISABLE
BAUD RATE	300 – 19.2 K	9600
DATA BITS	7 OR 8	7
PARITY CHECK	EVEN/ODD/MARK/SPACE /NONE	EVEN
INTERCHARACTER DELAY	0 ms – 120 ms	0 ms
TIME OUT DELAY	10 ms – 30 sec	2 sec
ON LINE MODE (MODEL 310)	HALF/FULL	HALF
COMMUNICATION MODE	POINT-TO-POINT /MULTIPOINT/X MODE	POINT-TO-POINT
MULTIPOINT ADDRESS	00 – 1F (HEX)	00 HEX
ENQ/EM	ENABLE/DISABLE	DISABLE
STX/ETX	ENABLE/DISABLE	DISABLE
ACK/NAK	ENABLE/DISABLE	DISABLE
BCC	ENABLE/DISABLE	DISABLE

Chapter 4

SETUP THE READER

You may set up the reader in two ways as previously mentioned.

4.1 SET UP FROM COMPUTER COMMANDS

Setup commands can be downloaded from the computer through the serial port. All the commands can be concatenated, and will become effective only when the Exit up mode command is received. That means, all the current effective parameters (specially for communication parameters) should be followed while downloading.

The format of the command string should

- (a) Begin with the enter Set up mode command (&@)
- (b) Be followed by the Setup commands of your choice
- (c) End with the exit Set up mode command (CTRL-Z)

If the command string contains invalid characters, error occurs, the error LED on the front panel will be lit, all setting commands are aborted automatically. Current effective commands remain unchanged.

Except for the control command group (no parameters), all other commands have the following format.

XX (n) or XX (nn)

XX is a two-characters command I.D.

(n) or (nn) represents the parameter selections

Both are ASCII codes.

COMMAND	FORMAT(XX)	PARAMETER(N)	DEFAULT(*)
[CONTROL]			
Enter Set up mode	&@	--	--
Exit Set up mode	CTRL-Z	--	--
Abort current setting	ESC	--	--
Restore default	\$\$		
[BARCODE]			
Read UPC/EAN	BA(n)	0 -- disable	
		1 -- enable	*
Read Code 39	BB(n)	0 -- disable	
		1 -- enable	*
Read I 2 of 5	BC(n)	0 -- disable	
		1 -- enable	*
Read Codabar	BD(n)	0 -- disable	
		1 -- enable	*
Read Full ASCII 39	BE(n)	0 -- disable	
		1 -- enable	*
Read Code 11	BF(n)	0 -- disable	
		1 -- enable	*
Read Code 128	BG(n)	0 -- disable	
		1 -- enable	*
Select scanner type	BX(n)	0 -- pen type	*
		1 -- auto scanner	
UPC-A output format	IB(n)	0 -- 13 digits	
		1 -- 12 digits	*
[DATA ENTRY]			
Record Size	DR(nn)	01-16	01
Field Width	DF(nn)	01-64	64
Record Delimiter	DL(n)	any ASCII code	CR

NOTE: Do not set Record delimiter and field delimiter to the same character.

The <Enter setup> command, "&@", is only applicable before the first bar code scanning after power-on the system. This feature may prevent from enter <Enter Set up mode> unexpectedly when there is data string "&@" in the data packet received from Host.

When STX/ETX protocol characters are enable (i.e. in X mode). The user should avoid using those protocol characters as Record, Field delimiter or pre/postamble characters, otherwise, unexpected communication error may occur.

Field Delimiter	DM (n)	any ASCII code	,
Pre/postamble	DS (nn...) @& ASCII strings (nn...) @&		none

Note: This command format is a little different from others.
 @& is the separator between preamble and postamble, or as
 a terminator of postamble. See Example 3, below.

Transmit start character	DX (n)	0 --- no 1 --- yes	*
Transmit stop character	DY (n)	0 --- no 1 --- yes	*
Verify check digit	DC (n)	0 --- no 1 --- yes	*
Re-enter Verification	DE (n)	0 --- disable 1 --- enable	*
Beeper Volume	DB (n)	LOW 0 — HIGH 9	5

[COMMUNICATION]

XON/XOFF	CX (n)	0 --- disable 1 --- enable	
CTS/RTS	CC (n)	0 --- disable 1 --- enable	*
Baud Rate	CB (n)	0 --- 19200 1 --- 9600 2 --- 4800 3 --- 2400 5 --- 600 6 --- 300	*
Data Bits	CD (n)	0 --- 7 1 --- 8	

Parity Check	CP (n)	0 --- even 1 --- odd 2 --- mark 3 --- space 4 --- none	*
Intercharacter delay	CI (n)	0 --- 0 ms 1 --- 2 ms 2 --- 5 ms 3 --- 10 ms 4 --- 20 ms 5 --- 50 ms 6 --- 100 ms	*
On line mode (model 310)	CF (n)	0 --- half duplex 1 --- full duplex	*
Time out delay	CT (n)	0 --- 10 ms 1 --- 100 ms 2 --- 500 ms 3 --- 2 sec 4 --- 10 sec 5 --- 20 sec 6 --- 30 sec	*
Communication mode	CM (n)	0 --- point-to-point 1 --- multipoint 2 --- X mode	*
Multipoint address	CA (nn)	00 -- 31	00
<hr/>			
[PROTOCOL]			
ENQ/EM	PE (n)	0 --- disable 1 --- enable	*
STX/ETX	PS (n)	0 --- disable 1 --- enable	*
ACK/NAK	PA (n)	0 --- disable 1 --- enable	*
BCC	PB (n)	0 --- disable 1 --- enable	*

Note: User defined Protocol should be selected according to the communication mode. i.e. point-to-point or multipoint.

Example 1.: Restore the factory set default

& @ \$ \$ CTRL-Z

Example 2.: The user wants to set up the reader as

I 2 of 5 disabled, Code 39 enabled, one field per record, field width is 16 characters

& @ BC0 BB1 DR01 DF16 CTRL-Z

Example 3. If user desires to put <ESC> <CTRL-A> as preamble and <CTRL-C> <CTRL-Z> as postamble, then the command is

DS <ESC> <CTRL-A> @& <CTRL-C> <CTRL-Z> @&

If only preamble is needed, then

DS <ESC> <CTRL-A> @& @&

If only postamble is needed, then

DS @& <CTRL-C> <CTRL-Z> @&

NOTE: Except for pre/postamble, if the command string is too long, you can put a space, CR, LF or combined CRLF in place of string, there will be no effect on command interpreter.

4.2 SETUP WITH BAR CODE SCANNING

This method should be applied when the reader is initially powered on. You can setup the reader by scanning the bar code label directly on the menu sheet. Select the parameters you want to change only by scanning the command labels.

Follow the steps below:

- (a) Make sure the reader is installed properly
- (b) Turn on the reader
- (c) Scan enter setup model label
- (d) Check if the front panel Setup LED is lit (model 300) or if there is the "PC-WAND 300 setup mode" message displayed on screen (model 310)
- (e) Select the parameters you want to change, find the label on menu and scan.
- (f) Repeat step (e) if more parameters need to be set up.
- (g) Scan exit Setup mode command to finish and save
- (h) When Setup LED is extinguished, it means the Setup is complete.

If necessary, you may scan the abort label during scanning to escape from Setup mode. All new settings will be invalid. The currently effective parameters remain unchanged.

Most commands are performed by one time scan only. Except for record size, field width beeper volume and multipoint address, you should scan the ID labels first, then proceed to the numeric sheet and scan the desired individual number.

Chapter 5

OPERATION

5.1 SELF TEST

The model 300 series on line reader will test itself automatically when powered on. An audible beep will be generated if testing is OK; otherwise, re-check cable connections and power again.

5.2 SCAN WITH SCANNER

when scanning with a pen type scanner, keep the scanner at a angle of between 45 and 90. While scanning barcodes, move it across the label in either direction. Any barcode label should be readable by scanning either from right to left or from left to right scanning. A successful read will cause the reader to beep audibly. When scanning with other types of scanner, like auto-none contact or C.C.D., check the scanner specification before scanning.

A barcode test chart is illustrated in section 5.8.

5.3 ACCUMULATE MODE

If the barcode label is damaged or bent and the reader is unable to read it, you can input the characters one by one by scanning the bar code just like keying in from the keyboard. Follow the procedures below:

- (a) Scan Enter Accumulate mode label on SETUP ACCUMULATE SHEET. A long beep will be generated when scanning the ACCUMULATE label.
- (b) Start scanning either numeric or alphabetic characters on the LABEL SHEET one by one.
- (c) When finished with one label, i.e. one string, scan "Enter" label
- (d) Repeat (b) and (c) for consecutive label reading
- (e) Scan END ACCUMULATE mode label when completed. Two Short beeps will be generated.

5.4 SEND THE DATA TO THE COMPUTER

All scanned barcode label data will be sent to the computer record by record as stated in Section 3.3.

5.5 RECEIVE THE TEXT FROM THE COMPUTER

The text can be in either Setup commands or displayed messages. Both model 300 and 310 can receive Setup command, but displayed message is only meaningful when using model 310.

Model 310 has a 16 x 2 LCD screen on the front panel.

You can format the screen by sending a message to the reader from the computer. All displayable characters can be sent to the reader for displaying with the following additional control characters.

<u>CODE</u>	<u>HEX</u>	<u>DESCRIPTION</u>
-------------	------------	--------------------

Bell	07	Active beeper (approxminately 500 ms)
------	----	---------------------------------------

HT	09	TTL-level digital output pulse generation. Command syntax: <u>09</u> <u>X</u>
----	----	--

After receiving this command, the PW310 will output a TTL-level digital pulse for (X- 20hex) seconds through LED2 port on PCB and it also shows an "X" on LCD during the period when the pulse is generated. For instance, a command, 09 # (# = 23hex) will generate a three-second pulse (23 hex - 20 hex).

LF	0A	New line: move cursor down one line and to the left margin. If the cursor is on the bottom line, the display will be scrolled up one line, and the top line will be lost.
----	----	---

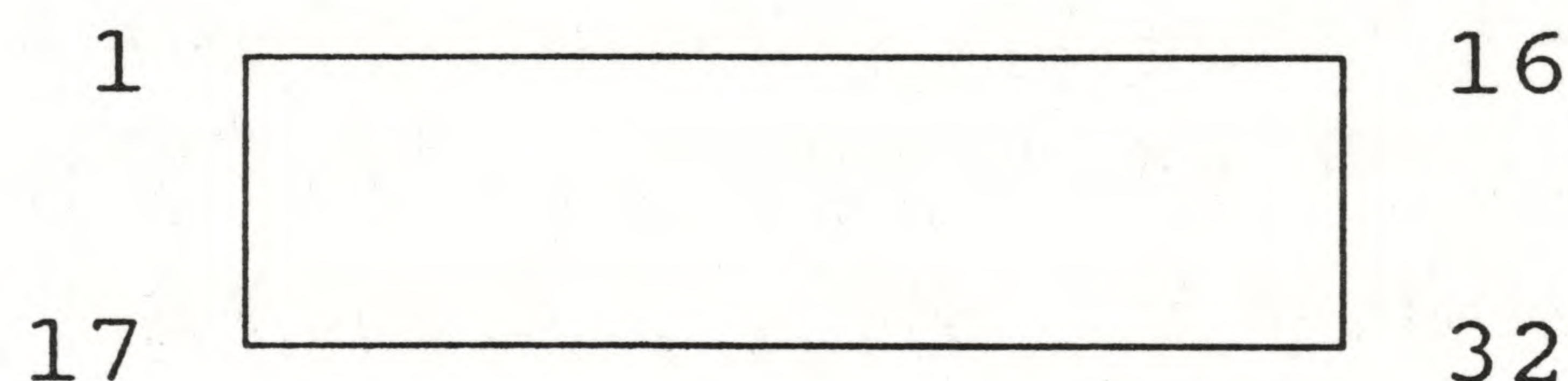
VT	0B	When this code is received, the PW310 acts as an <Enter Accumulate> bar code label is scanned.
----	----	--

FF	0C	Clear display: leave the cursor at the left margin on the top line.
----	----	---

CR	0D	Return: return the cursor to the beginning of the current line.
----	----	---

PLE	10	Load the cursor address: this code precedes a cursor address code. Upon receipt of the address code, the cursor will be displayed in the new position.
-----	----	--

The relative position address is shown below:



The valid address codes are:

<u>HEX</u>	<u>POSITION</u>
20	1
21	2
.	.
.	.
.	.
3F	32

Example: The 310 reader is connected to a PC through RS-232C port. The user want to display a message on L.C.D as shown below:

PC-WAND BarCode Solution

Please refer to Page 18. The <text> which PC sends to 310 is
(text) : <0C> <10> <25> PC-WAND <0D> <0A> BarCode Solution

5.6. SELF PROMPTING

Section 5.5. describes how the comptuer can send a message to be displayed on the L.C.D. of the 310 reader. Although it is easy to make, but in most data entry cases, before scanning the barcode lable, a prompting message may always be needed to be shown on L.C.D. for alternation purpose. For a multiple fields entry application, field's prompting message should be shown subsequently and continuously. For instance, enter Item, enter Price, enter Quantity . . . etc. Thus, it is a time consuming tedious job if the computer should send message for every entry.

Self prompting provides a method to avoid this problem. That is, the user can send the message to the computer at the beginning. After receiving this message, the 310 will display prompting messages automatically. The format of this special command is shown as below:

DP <prompting #1> <fs> <prompting #2> <fs> . . .
<prompting #n> <fs>

The number of promptings n depend on the presetted record size. <fs> is a unit separator which separates prompting messages, <1C> hex.

Note that, the self prompting message always on L.C.D. from the 1st line of L.C.D., maximum 16 characters per field is allowed.

For example, there is a data entry form, including 3 fields, as item, price and quantity. We desire to make the self prompting, then computer should send the command as following:

&@ DP item: <fs> price: <fs> quantity: <fs> <CTRL-Z>

When prompting is being used, then the scan data displayed on the L.C.D. should be cleared when next field's prompting comes out. Thus a display delay time also let user to define it.

The format is

DT <n>	when n = 0	delay	1/4 sec
	n = 1		1/2 sec
	n = 2		1 sec
	n = 3		1 1/2 sec
	n = 4		2 sec
	n = 5		3 sec

For example, the above example, we want the scanned data to be displayed time last for 1/2 Sec before next field prompting comes out, then

&@ DP Quantity : <us> DT 1 <CTRL-Z>

Note that although each field can have up to 16 characters prompting message, totally 50 characters is limited, this command is different from other configuration commands, and it'll not be saved in non-volatile memory, which means that when power off, the messages are disappeared. The user has to download this command to the 310 when power on.

Since all the Setup commands are only effective when the EXIT command is executed as section 3.1. stated, such that, when using self prompting commands, the user should preset the record size to appropriate value before issuing the above &@DP command. For instance, send & @ D R 0 3 <CTRL-Z> first, then following with & @ D P . . . <CTRL-Z> command.

5.7 STATUS MESSAGES OF READER

The reader uses combined beep and LED lights on front panel to indicate the status of the reader.

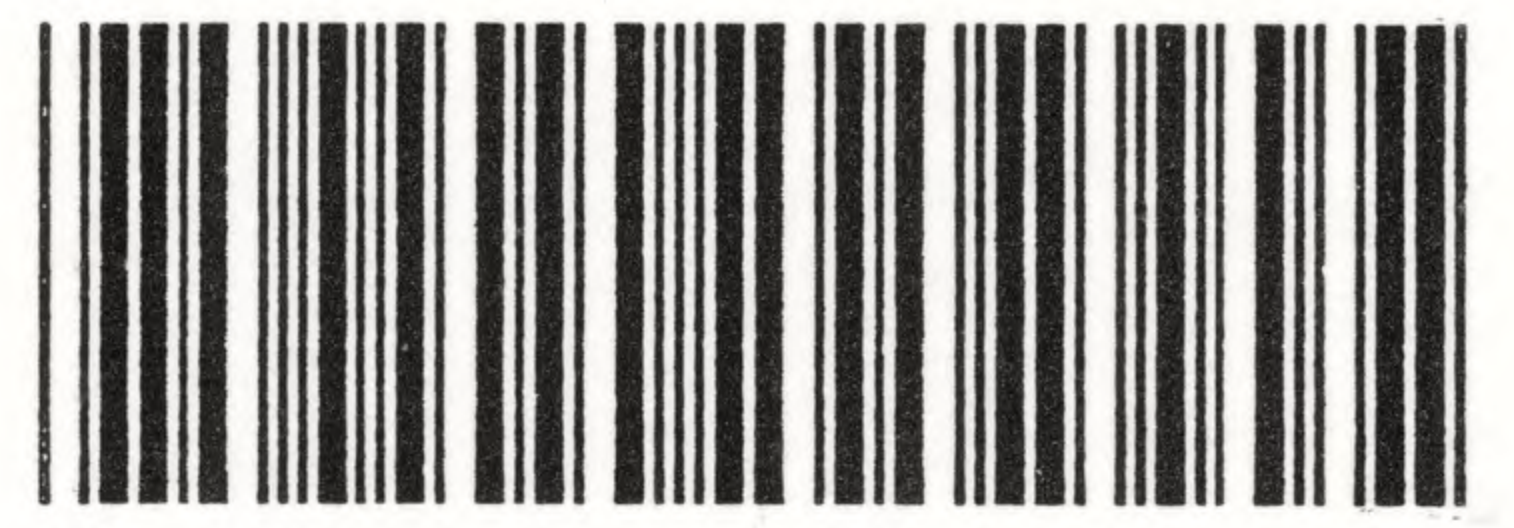
Check following table for the intended message:

<u>LED</u>	<u>BEEPER</u>	<u>STATUS</u>
Power-on	one long beep	reader is OK when powered on
Power-on	5 short beeps	self test is not OK
Error-on		
Set up-on	one short beep	reader enter Setup mode
Set up-on	5 short beeps	reader reads invalid Setup
error-on		command
—	—	Scanning bar code label is
		not good
—	one short beep	successful scanned
—	2 short beeps	Re-enter verification is OK
Error-flashing	10 short beeps	communication time out error
Error-on	—	buffer full, wait

NOTE:

- (1) The power LED should always be on when operating.
- (2) Error LED always on or flashing when beeper beeps; off when beeper is off.

BAR CODE TEST CHART



UNITECH

CODE-39



PC-WAND



9 8 7 6 5 4 3 2 1 0

**INTERLEAVED
2 OF 5**



1 1 2 2 3 3 4 4 5 5



123456

CODABAR



547839

EAN-13



UPC-A



**EAN-8/
UPC-E**



Appendix

SPECIFICATION

* Power

- Operating voltage : +5V \pm 5% DC
- Input voltage : +9V DC
- Operating current: 300 mA
scanner excluded

* Temperature

- Operating: 0°C to 50°C
- Storage : -20°C to 70°C

* Humidity

- 0% to 95% relative humidity
(non-condensing)

* Connectors

- Scanner: 5 pin DIN
- RS-232C port: 25 pin D female connector
- RS-485 port: 25 pin D female connector
(shared with RS-232C) and 6 pin RJ11
Phone Jacks.

PC-WAND MODEL 300 CONFIGURATION SET UP LABEL SHEET

[CONTROL]



ENTER SET UP



EXIT SET UP



ABORT SET UP



RESTORE DEFAULT

[BARCODE]

Barcode Symbologies



EAN/UPC enable



EAN/UPC disable



CODE 39 enable



CODE 39 disable



I 2 of 5 enable



I 2 of 5 disable

PC-WAND MODEL 300 CONFIGURATION SET UP LABEL SHEET

Barcode Symbolologies



CODABAR enable



CODABAR disable



FULL 39 enable



FULL 39 disable



CODE 11 enable



CODE 11 disable



CODE 128 enable



CODE 128 disable



UPC-A 12-digit



UPC-A 13-digit

Scanner Selection



AUTO SCANNER



PEN SCANNER

PC-WAND MODEL 300 CONFIGURATION SET UP LABEL SHEET

[DATA ENTRY]

preamble/postamble

1.



2. scan character string

3. scan enter

4. repeat 2,3 for postamble

record delimiter

1.



field delimiter

1.



2. turn to FULL ASCII sheet & scan one character

start character



eliminate



Keep

stop character



eliminate



Keep

PC-WAND MODEL 300 CONFIGURATION SET UP LABEL SHEET

Re-enter



ENABLE



DISABLE

Check Digit Verify



ENABLE



DISABLE

Record Size

1.



Field Width

1.



2. turn to numeric sheet & scan two labels

Beep Volume

1.



2. turn to numeric sheet & scan one label

PC-WAND MODEL 300 CONFIGURATION SET UP LABEL SHEET

[COMMUNICATION]

Baud Rate



19200



9600



4800



2400



1200



600



300

Parity Check



EVEN



ODD



MARK



SPACE



NONE

PC-WAND MODEL 300 CONFIGURATION SET UP LABEL SHEET

Data Bits



Intercharacter Delay



PC-WAND MODEL 300 CONFIGURATION SET UP LABEL SHEET

[PROTOCOL]

ENQ/EM



ENABLE



DISABLE

STX/ETX



ENABLE



DISABLE

ACK/NAK



ENABLE



DISABLE

BCC



ENABLE



DISABLE

PC-WAND MODEL 300 CONFIGURATION SET UP LABEL SHEET

COMMUNICATION MODE



POINT-TO-POINT



MULTIPOINT



X MODE

XON/XOFF



ENABLE



DISABLE

RIS/CTS



ENABLE

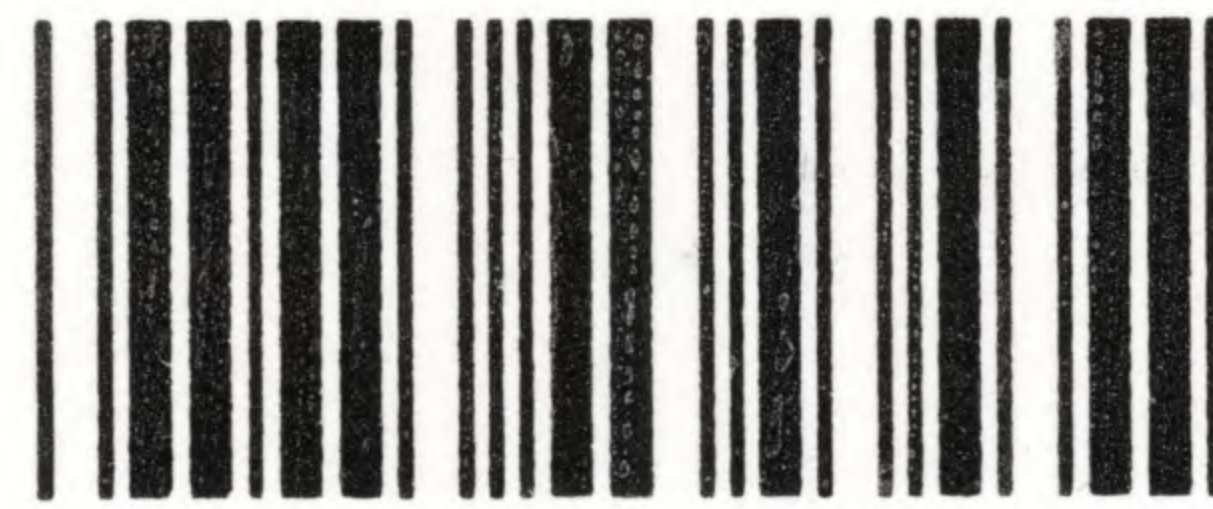


DISABLE

ON LINE MODE



HALF DUPLEX



FULL DUPLEX

PC-WAND MODEL 300 CONFIGURATION SET UP LABEL SHEET

TIME OUT DELAY



10 ms



100 ms



500 ms



2 sec



10 sec



20 sec



30 sec

MULTIPOINT ADDRESS

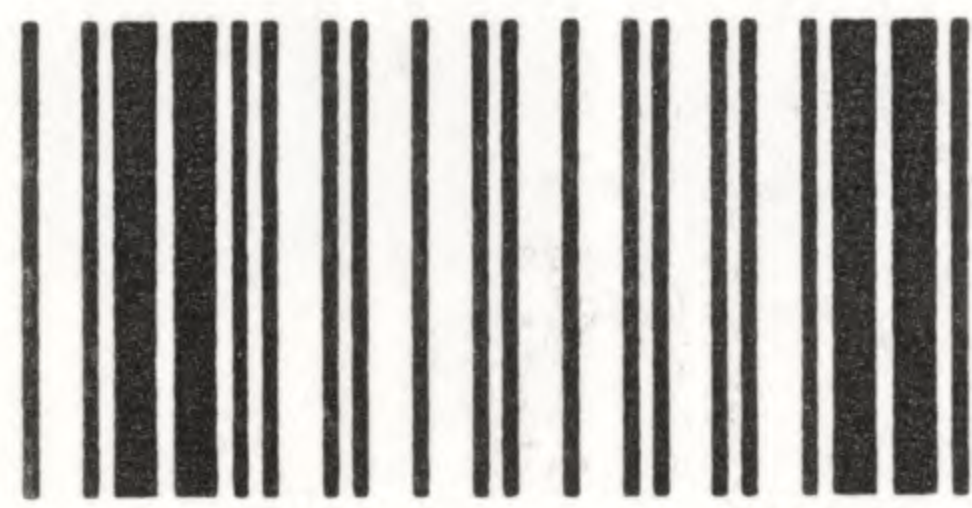
1.



2. turn to numeric sheet & scan two labels

PC-WAND MODEL 300 ACCUMULATE SHEET

[ACCUMULATE]



ENTER ACCUMULATE



EXIT ACCUMULATE



ENTER

[NUMERIC]



0



1



2



3



4



5



6



7



8



9



ENTER

PC-WAND MODEL 300 FULL ASCII SHEET



NUL



ACK



FF



SOH



BEL



CR



STX



BS



SO



ETX



HT



SI



EOT



LF



DLE



ENQ



VT



DC1



ENTER

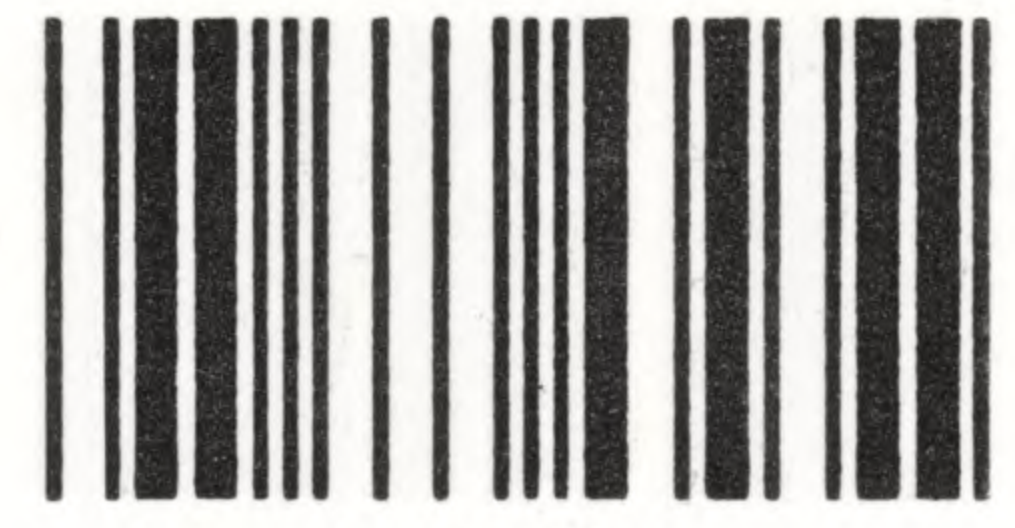
PC-WAND MODEL 300 FULL ASCII SHEET



DC2



CAN



RS



DC3



EM



US



DC4



SUB



SP



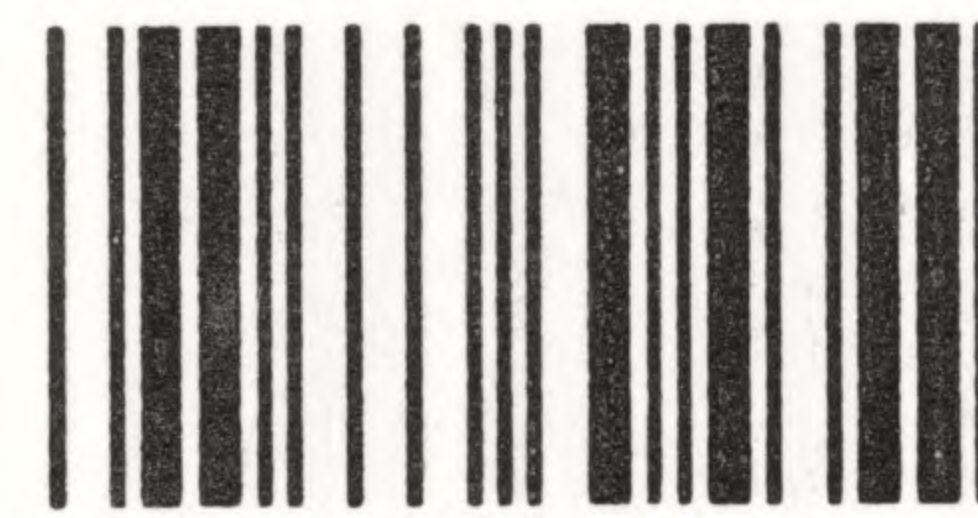
NAK



ESC



!



SYN



FS



"



ETB



GS



#



ENTER

PC-WAND MODEL 300 FULL ASCII SHEET



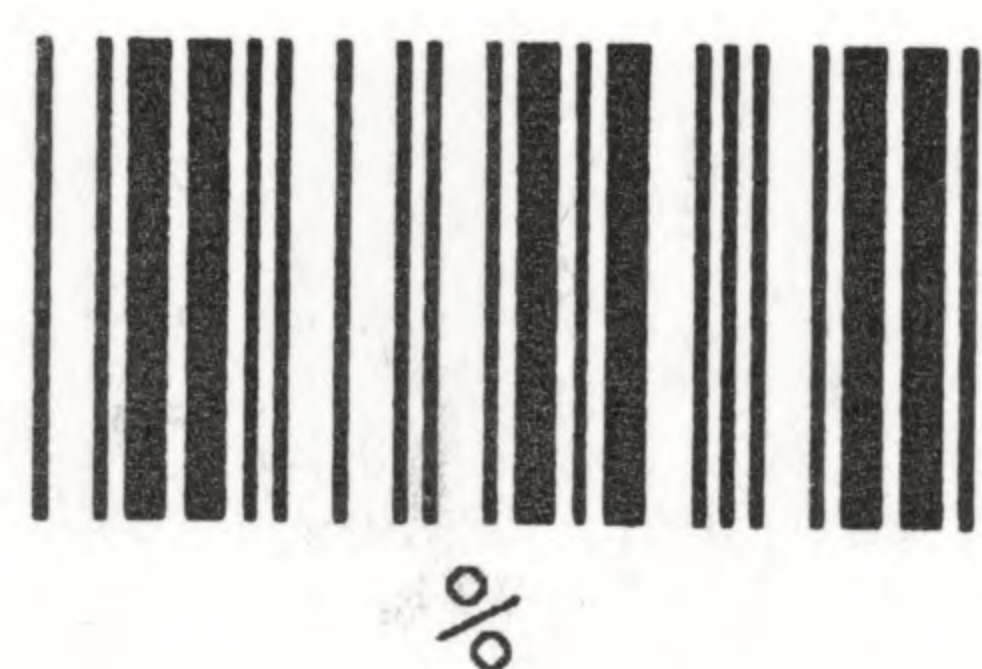
\$



*



0



%



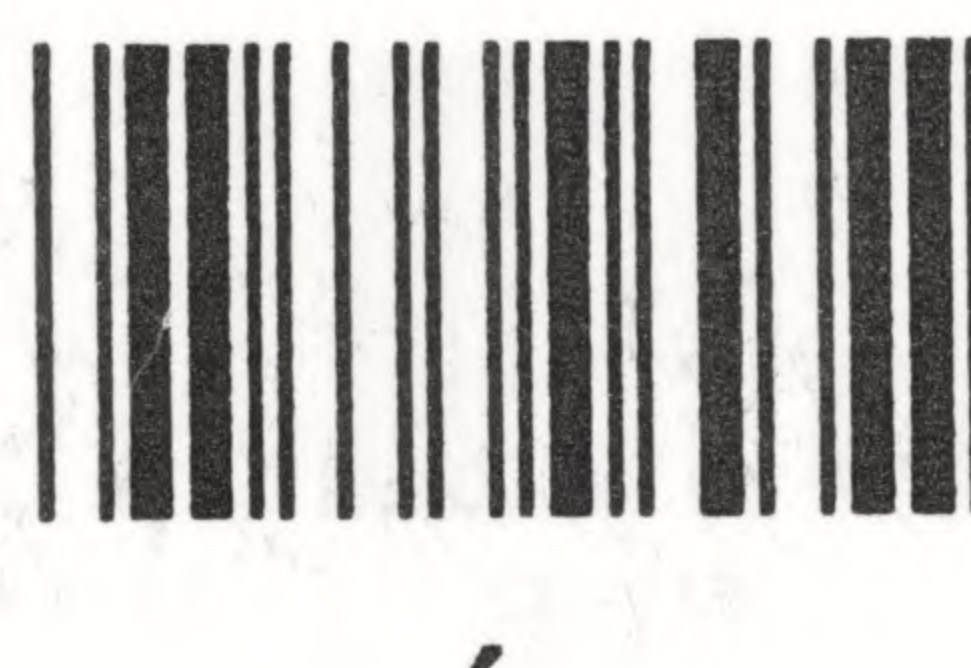
+



1



&



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2



'



-



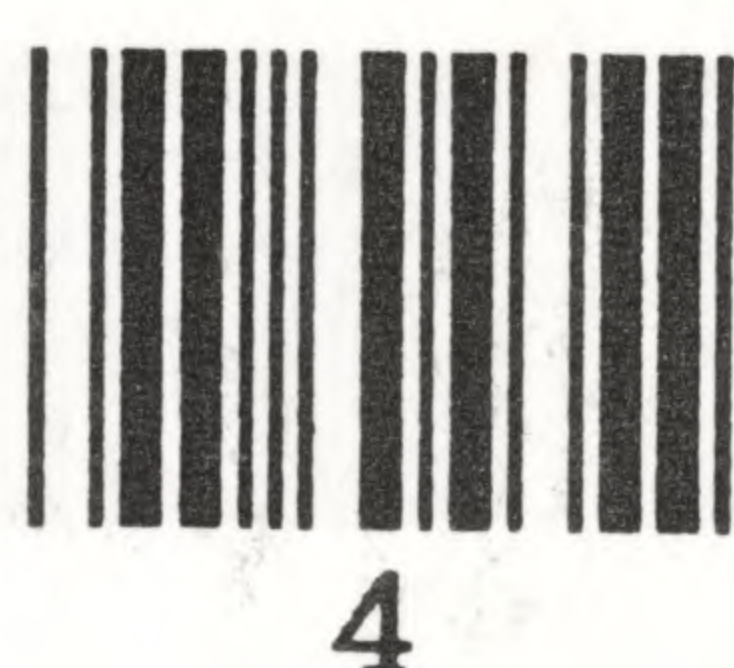
3



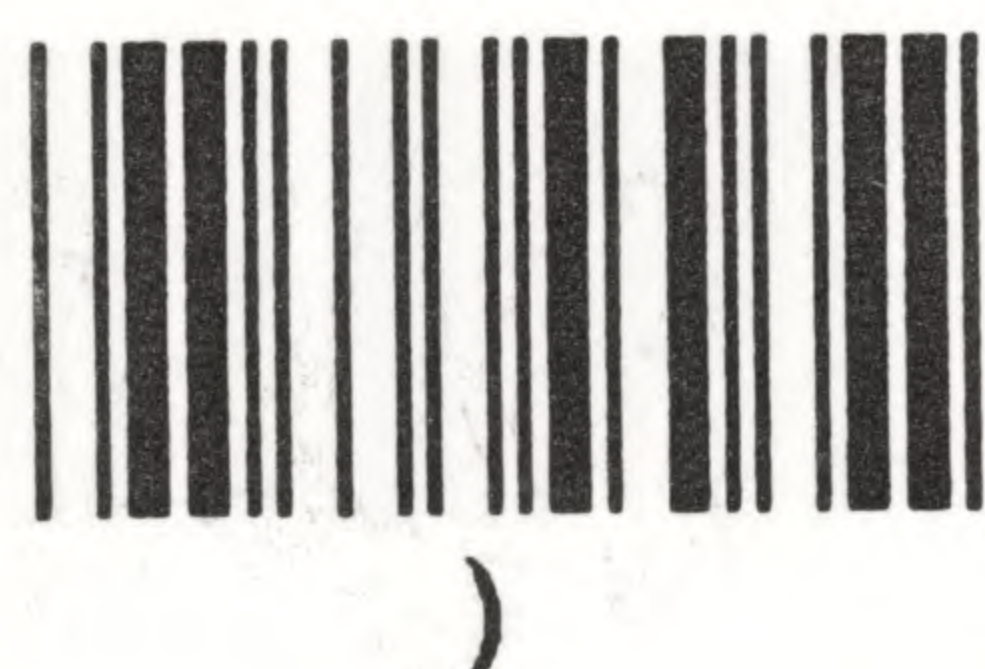
(



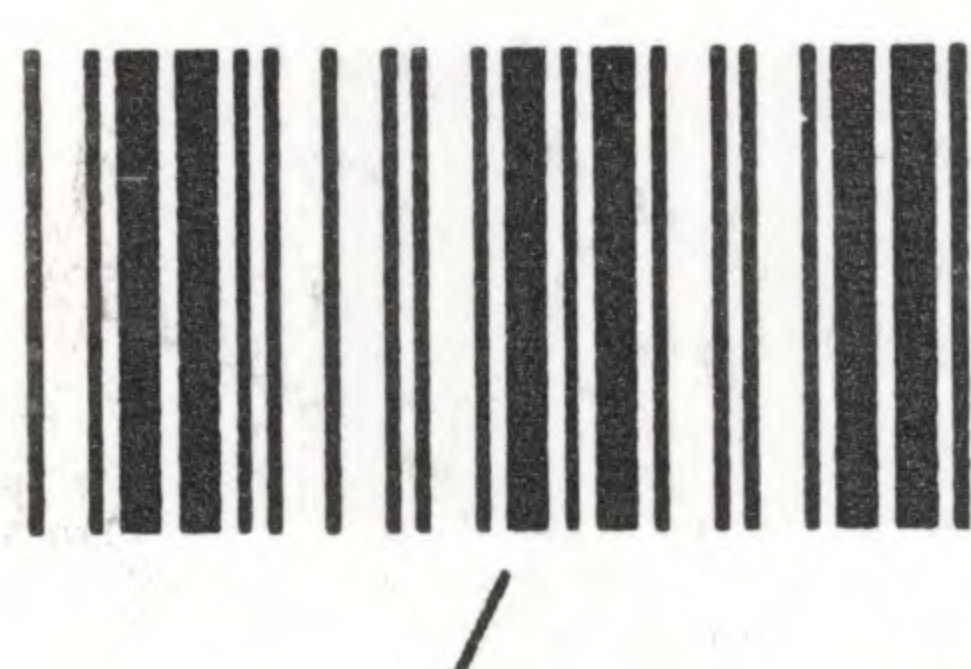
.



4



)



/



5



ENTER

PC-WAND MODEL 300 FULL ASCII SHEET



6



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B



7



=



C



8



>



D



9



?



E



:



@



F



;



A



G



ENTER

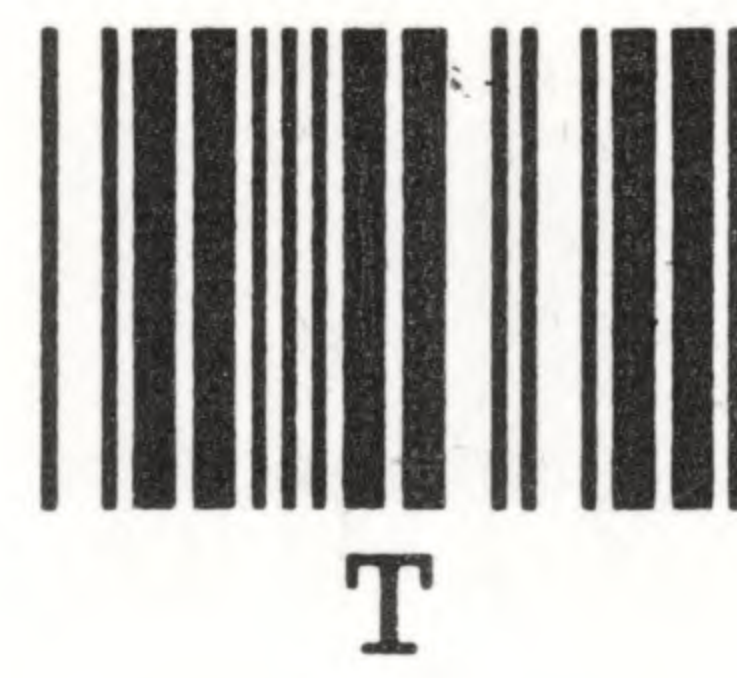
PC-WAND MODEL 300 FULL ASCII SHEET



H



N



T



I



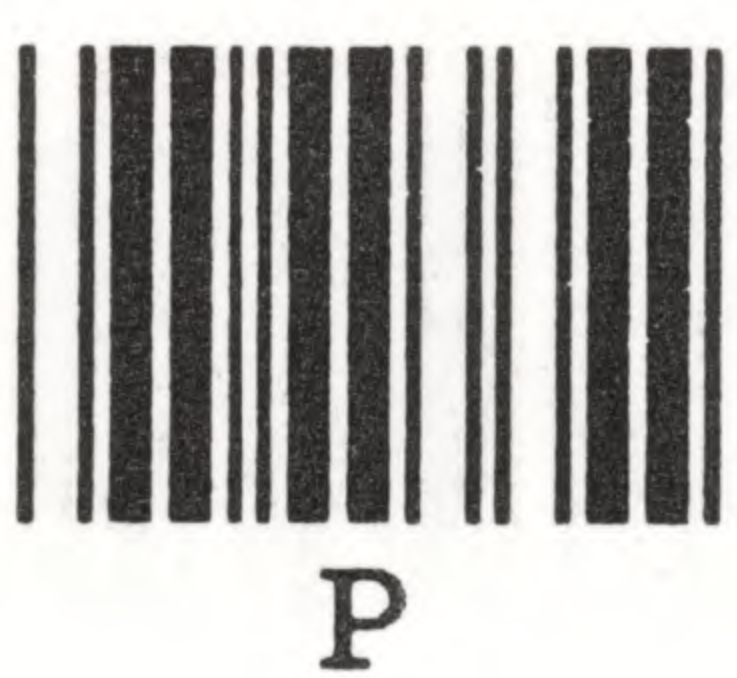
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Q



W



L



R



X



M



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Y



ENTER

PC-WAND MODEL 300 FULL ASCII SHEET



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b



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d



j



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e

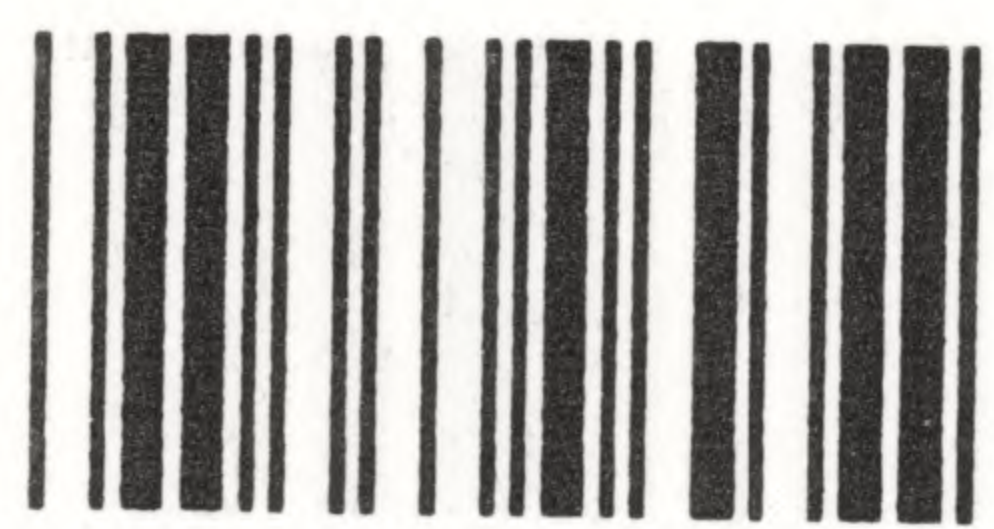


k



ENTER

PC-WAND MODEL 300 FULL ASCII SHEET



l



s



z



m



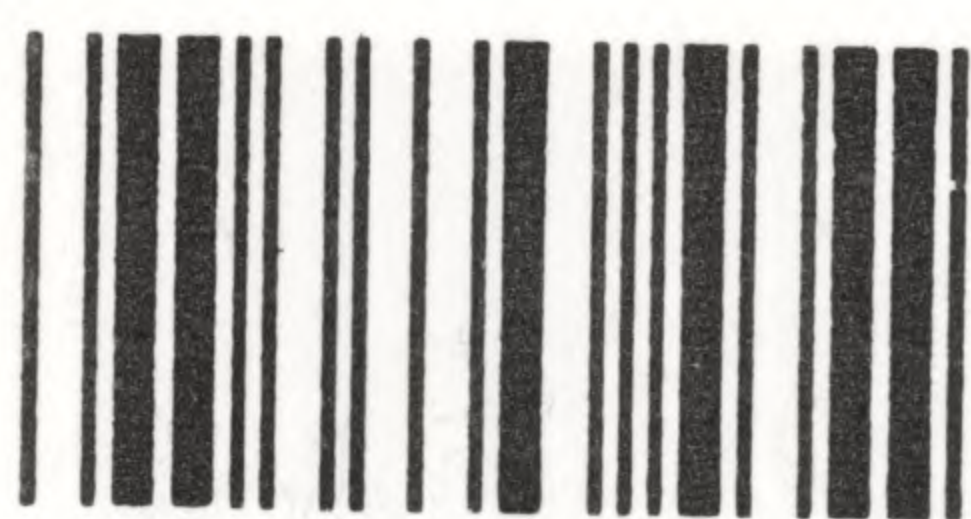
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v



}



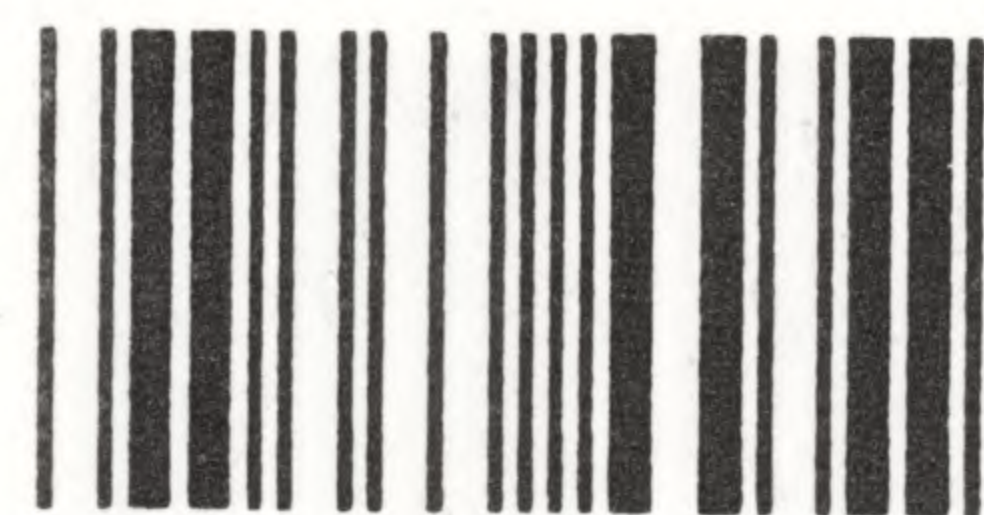
p



w



~



q



x



DEL



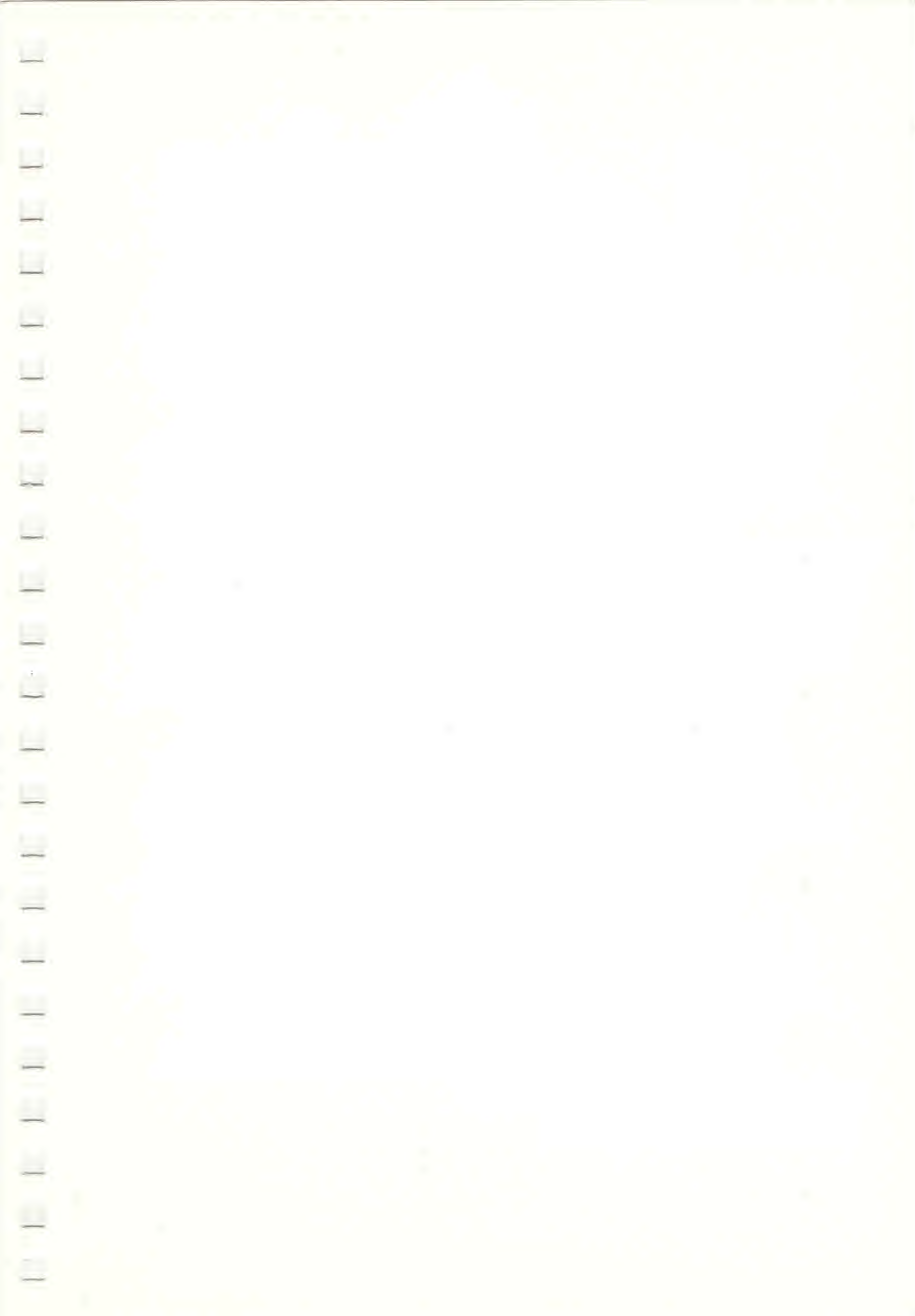
r



y



ENTER



THE UNIVERSITY OF CHICAGO PRESS

